DOMESTIC ENGINEERING

Whole Number 140 *Chicago and New York, June Fifteenth, Nineteen Hundred and One* *Vol. 21, No 3*

NEW YORK, BOSTON, MINNEAPOLIS, DENVER, PHILADELPHIA, ST. LOUIS, LONDON, HAMBURG **AMERICAN RADIATOR CO.** GENERAL OFFICES LAKE & DEARBORN STS. CHICAGO.

DON'T SWEAR
USE OUR INCANDESCENT MANTELS IN 1901
Harding Incandescent Co.
HARDING BLDG.
CHICAGO.

PATTERNS
GOBEILLE PATTERN CO. Cleveland, O.

BUFFALO FANS

Heating
Ventilating
Drying
Mechanical Draft, Etc.

BUFFALO FORGE CO., BUFFALO, N.Y.

The Pattern Shop of the East
H. B. OLMSTEAD & CO.
87 FRANKFORT ST NEW YORK

F. E. Cudell's PATENT sewer gas and back-water trap

S+S+S R. B.

for wash bowls, sinks, bath and wash tubs

Put into the White House by the U. S. government. For venting use vent trap.

CLEVELAND, OHIO

Mantle Chemicals
The Roessler & Hasslacher Chemical Co.
Office: 100 William St., New York.
Chicago Office: 16 N. Clark Street.

WATER SUPPLY BIG VOLUME L. E. RHODES CO. HARTFORD, CT. LIFTS

See our Advertisement...Page 133

WHAT A DIFFERENCE
In the quality of Plumbing work.
RAYMOND'S

COMBINATION FERRULES MAKE RELIABLE CONNECTIONS BETWEEN LEAD AND IRON PIPES.

WHY?

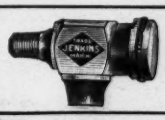
Because they have an extra thickness of lead over the shoulder, giving strength where it is needed, and where other Lead Ferrules are weak.

The genuine article bears our label.

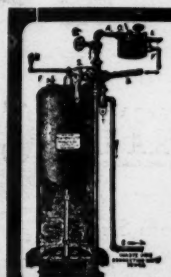
RAYMOND LEAD COMPANY, CHICAGO.

SEE ADV. ON PAGE IV
Paragon Boiler
ISAAC A. SHEPPARD & CO., - PHILADELPHIA

MICA INSULATING JOINTS
GAS, ELECTRIC AND COMBINATION FIXTURES
J. L. OEFINGER MFG. CO.
14 N. CANAL ST. CHICAGO, ILL



JENKINS' IMPROVED AUTOMATIC AIR VALVES
Suitable for high or low pressure. Takes no more room than ordinary air cock. Endorsed by the leading steam experts as the best made and the quickest working. All genuine stamped with our Trade Mark.
JENKINS BROS., New York Boston Chicago Philadelphia



Constructed under the Jewell Warren Continental & Hyatt Patents
GRAVITY AND PRESSURE FILTERS
WRITE FOR CATALOGUE
New York Continental Jewell Filtration Company
40-42 W. Quincy St., CHICAGO. 15 Broad St., NEW YORK.

For Office Buildings
FRINK'S CLUSTER REFLECTORS
for from three to eight lights will light offices more brilliantly, evenly and economically than any other fixture. Their extreme durability and power make them the cheapest to buy.
I. P. FRINK, 551 Pearl ST., NEW YORK

EXPORT TRADE

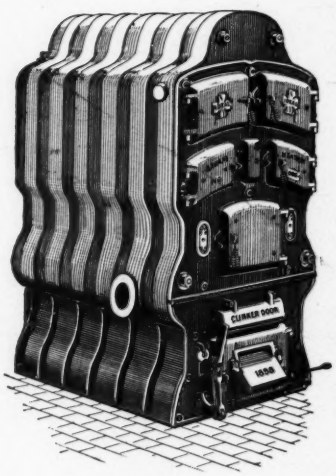
Every manufacturer interested in export trade should read the **"Foreign Trade Opportunity"** department in our Weekly edition.

"Things small, but significant, soon become important."

We feel that the many little important improvements made in

our 1901 line

of Ideal Boilers will strengthen and continue the high regard in which they are held by those who appreciate the fine points in boiler construction. May we furnish you our latest descriptive catalogue and prices?



AMERICAN RADIATOR COMPANY

Lake and Dearborn Streets

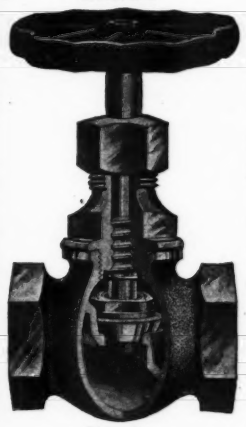
CHICAGO

NEW YORK
BUFFALO
MINNEAPOLIS

PHILADELPHIA
ST. LOUIS
DENVER

CRANE VALVES

BRASS



No. 1

CRANE STANDARD BRASS VALVES

are suitable for steam pressures up to 100 lbs., and are noted for their UNIFORM EXCELLENCE in design and construction.

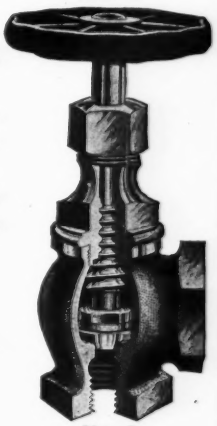
Made in globe, angle, gate, cross, check, etc., patterns, in sizes which should meet all requirements.

We are the largest makers of valves in the world and carry the largest stock, enabling us to fill orders promptly.

CLOSE COMPARISON
will surely induce you to
USE CRANE VALVES.

WRITE FOR POCKET CATALOGUE

ANGLE

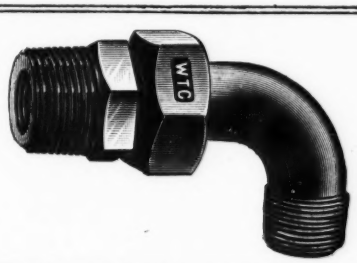


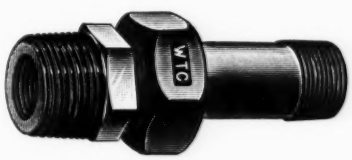
No. 2

NEW YORK
PHILADELPHIA
CINCINNATI
KANSAS CITY
SIOUX CITY
OMAHA

CRANE CO.
CHICAGO
ESTABLISHED 1855

ST. PAUL
ST. LOUIS
LOS ANGELES
SAN FRANCISCO
PORTLAND, ORE.



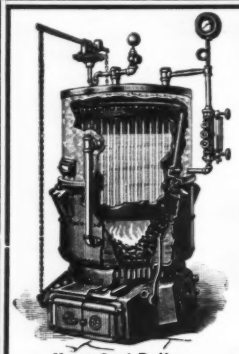


The "Kewanee" Boiler Coupling

BRASS and Iron Ball Joint Coupling. The coupling is brass, the ring and bottom piece malleable iron galvanized.

A coupling having all the advantages of a connection requiring no gasket to make a tight seal—besides a screw joint of different metals, thereby non-corrosive. The feature of an iron ring screwed to brass makes it possible to disconnect without injury to the ring.

WESTERN TUBE COMPANY
KEWANEE, ILL.



Hard Coal Boiler

The Gorton Side Feed Boilers

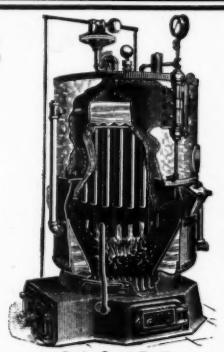
Insure a warm building day and night in coldest weather. Our book, "Modern House Heating," gives the information. Mailed free.

Send for a Copy and investigate for yourself.

Gorton & Lidgerwood Co.

96 Liberty Street, New York

77 Oliver St., Boston, Mass. Old Colony Building, Chicago Prudential Bldg., Atlanta, Ga.



Soft Coal Boiler

The Paragon Hot Water Circulator is just as good for heating by hot water as the Paragon Hot Air Furnace is for heating by hot air. Each is the best of its kind and every boiler and every furnace contains the essence of over 40 years experience in the heating business. Your customer is **absolutely sure** to get the best apparatus that money can buy, if the name plate says **"Paragon".**

ISAAC A. SHEPPARD & CO.

NEW YORK PHILADELPHIA BALTIMORE

TROUBLE WITH YOUR LIGHTS? NOT IF YOU USE

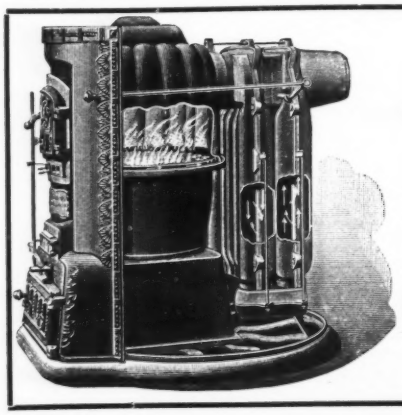
Cosmo Cap Mantle

Needs No Adjusting. Fits Any Incandescent Burner.

For Sale at all dealers **PRICE, 25 CENTS** Made by the

Cosmopolitan Incandescent Gas Light Co.

170 EAST MADISON STREET, CHICAGO



BENGAL FURNACE

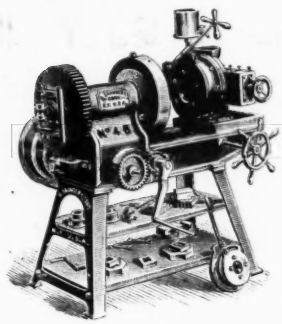
THE WONDER OF 1901 **IT HAS NO COMPETITOR**

DON'T KICK if your delay in securing the Agency for this Furnace has enabled the other fellow to get it. This is the opportunity of your life to secure the sale of the Best and Most Popular Furnace Made. The Bengal does the work, saves fuel, satisfies the customer, heats the house and NOT the chimney.

FLOYD, WELLS & CO., ROYERSFORD, PA.

EASTERN SELLING AGENTS.

GURNEY & CO., WASHINGTON, HANOVER, & ELM STS., BOSTON, MASS.



No. 4 B. Pipe Cutting and Threading Machine, ⅛-inch to 4 inches. Hand or Power.

D. SAUNDERS' SONS,

Manufacturers of Patent.

HAND PIPE CUTTERS

IN THREE STYLES.

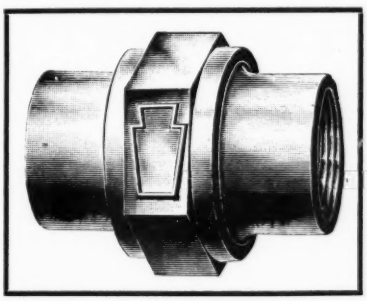
One Wheel and Roller Cutter; Three Wheeled Cutter; Tool Cutter,

FOR CUTTING BRASS, COPPER AND WROUGHT IRON TUBES.

Also Manufacturers of Pipe Cutting and Threading Machines 1-4 to 16 in., Hand or Power.

Send for Catalogue. 35 Atherton Street, YONKERS, N. Y.

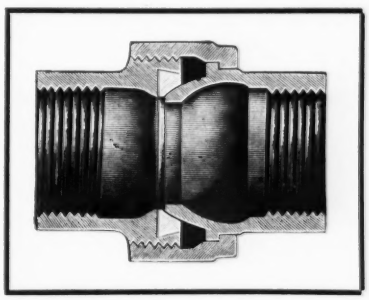
KEYSTONE UNIONS



Malleable Iron,
WITH
SOFT METAL SEAT
Are Always Tight.

MANUFACTURED BY

Stanley G. Flagg & Co.
NEW YORK PHILADELPHIA

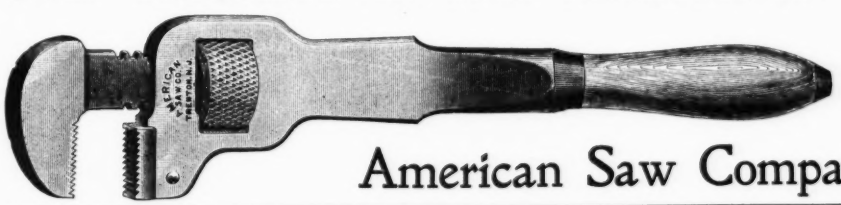


The Two Great Wrenches

THE "TRIUMPH" and THE "ALLIGATOR"

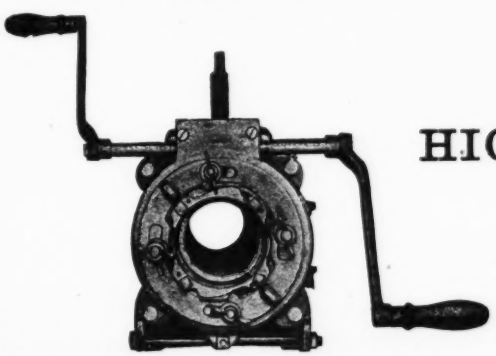
The Original. Always ready.
The Reliable. Always positive.
The Genuine. Never slips.

Never loses its grip or its handle.
Never crushes or locks on the pipe.
Can be used as a monkey-wrench or pipe-wrench.
Write for circulars and prices and mention DOMESTIC ENGINEERING



American Saw Company, Trenton, N. J.

Combination Vise and Screw Cutting Machinery



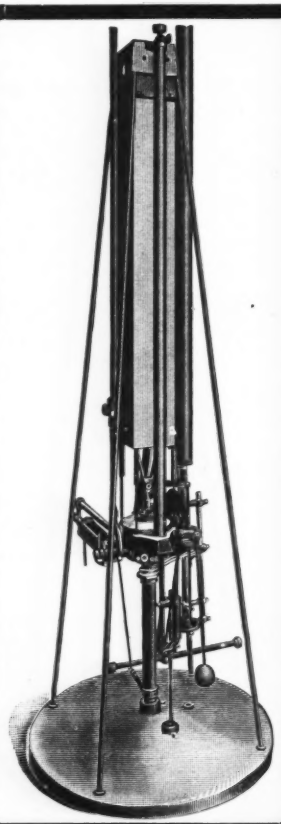
SAVES TIME AND MONEY
SEND FOR CATALOG AND PRICES

HICKMAN-MELHORN COMPANY

200-208 Liberty Avenue, PITTSBURG, PA.

SELLING AGENTS.

Strong, Carlisle & Hammond, Cleveland, Ohio.
National Supply Co., Toledo, Ohio.
A. Harvey's Sons Mfg. Co., Detroit, Mich.
James B. Clow & Son, Chicago, Ill.
The Robert Rom Co., Milwaukee, Wis.
M. M. Buck Mfg. Co., St. Louis, Mo.
Knight & Jillson, Indianapolis, Ind.
Ben. D. Potts, Columbus, Ohio.
The Law Co., New York, N. Y.
Cuyler & Mohler, Baltimore, Md.



"The light so bright that birds will sing and say it is not night."

Agents Wanted

To Handle the

U.L. Generator

Generating from 1 to 50 lights of 100 candle power. Lights may be turned on or off in any room on any floor like gas jets. Automatic, self regulating generator.

Price, $125.00

Liberal Discounts to Agents. For Terms and Territory address

Universal Light Co.

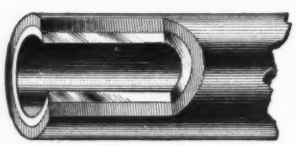
26-28 North Canal Street Chicago, Illinois

Simple and Safe

No Competitors

A Big Money Maker

Gasoline Tank may be placed 100 feet from Generator



L.&R. Patent Pipe

Tin-Lined Iron Pipe for Pure Water

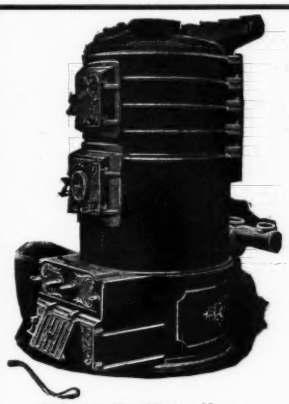
Cheaper than brass, about as cheap as lead, and SAFE
No brass or lead poisoning

SOLID. The Lining CANNOT BE SEPARATED from the Pipe even by Bending or Hot Water.

ALSO LEAD-LINED IRON PIPE MADE THE SAME WAY

LAMB & RITCHIE

CAMBRIDGEPORT, MASS.



400 Series Hot Water Heater.

Doric Hot Water Heater.

EVERY EFFORT COUNTS

If you expect to be successful you must expend your effort on a worthy object. It is useless to attempt to sell more heaters if those you've already placed fail to fulfill expectations. For such effort is wasted effort.

There is, however, a decidedly better way, namely, to push

"GURNEY"

...HEATERS...

For then you're handling a heater worthy of your best efforts. The "Gurney" Heater will do everything we claim for it, for the simple reason that we have constructed it so that it should attain just that end.

Naturally, it's profitable to handle, not only because each sale affords a satisfactory margin, but more so because each "Gurney" placed is the spokesman for several other sales.

We're always on the lookout for energetic agents, for dealers who are anxious to make more money than they are now making. Does that mean you? Then write us. Latest trade catalogue on request.

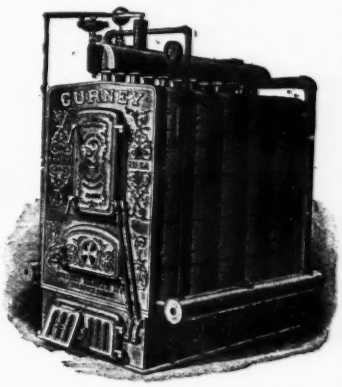
Gurney Heater Mfg. Co.

74 Franklin Street, Boston.

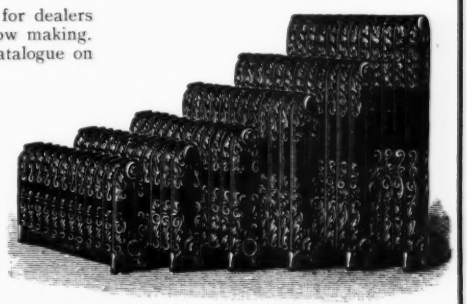
111 Fifth Ave., New York.

WESTERN SELLING AGENTS,

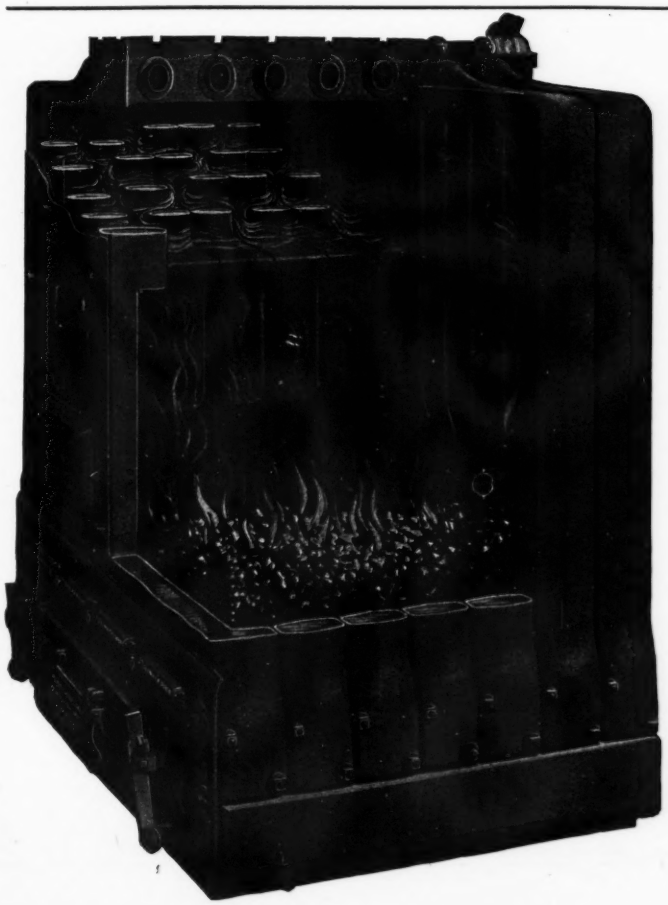
Jas. B. Clow & Sons, 222 to 224 Lake Street, Chicago, Ill.



Bright Idea Steam Boiler.



Duet Radiators for Hot Water and for Steam.



HENDERSON

THERMO WATER HEATER

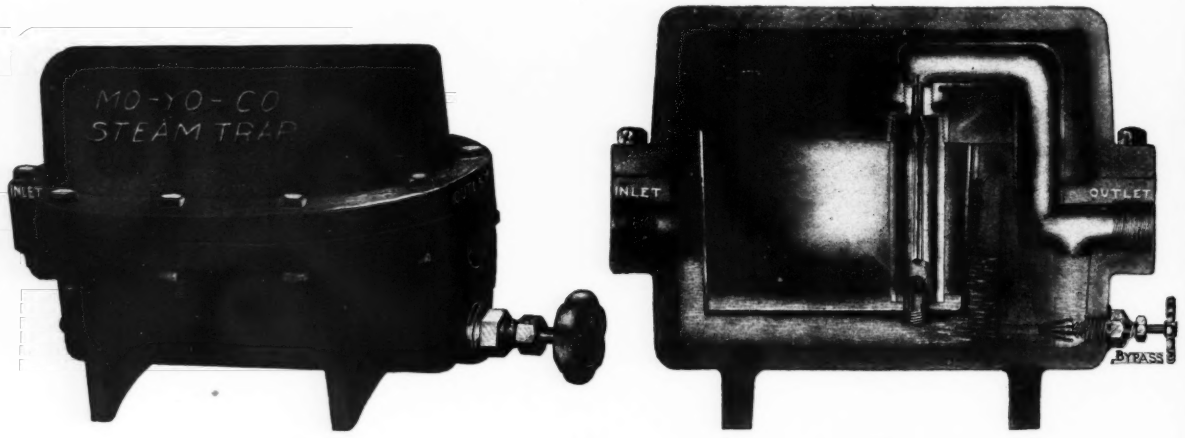
Fire surface unusually large in proportion to grate surface and wonderfully effective.
Staggered Flues.
Vertical Water Circulation.
All slip Nipple Joints and all outside the fire.
All parts interchangeable.
Special gas consuming appliance.

The Prizer-Painter Stove and Heater Co.

READING, PA.

34 NORTH CANAL ST. CHICAGO
284 AND 286 PEARL ST NEW YORK
215 FRANKLIN ST. BOSTON
213 HOWARD ST. DETROIT
929 FARRINGTON AVE. ST. PAUL

Mo=Yo=Co Steam Trap

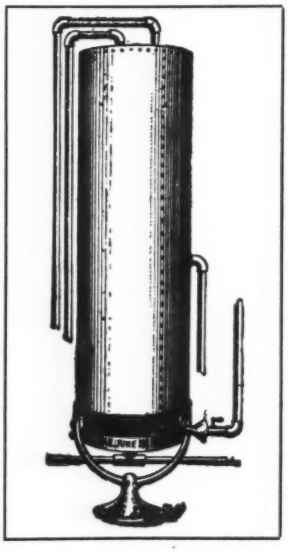


Monash=Younker Co.

MAKERS

43-45 Centre Street, New York. 201-207 S. Canal Street, Chicago.

THE A. HELLER HEATER

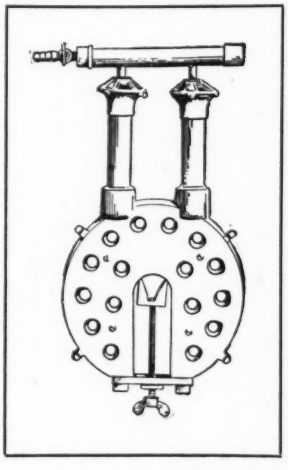


A GAS WATER HEATER

Is just the thing your Customer wants. It's the most Economical and Common Sense Heater ever put on the Market. It will supply the Kitchen and Bathroom with hot water. This heater is attached to the kitchen boiler and takes the place of the kitchen range as far as water heating is concerned, allowing the hot fire in the range to be dispensed with during the summer months. If a gas stove is used when cooking this heater will furnish hot water when wanted..... .

PERFECT COMBUSTION NO ODOR
NO DIRT NO SMOKE

Heats in less time, and for less cost than any gas or coal stove in the market.....



SOLD TO THE PLUMBING TRADE ONLY---- WRITE FOR CIRCULARS AND PRICES

J. P. B. SADTLER & CO., 813 SOUTH HOWARD STREET, BALTIMORE, MD.

WALLACE L. PIERCE, PRESIDENT
GEO. B. LITTLE, VICE-PRESIDENT

OSBORN B. HALL
GEN'L MANAGER MECHANICAL DEPT.

GEO. T. COPPINS, SECRETARY
GEO. H. GRAVES, TREASURER

Walworth Manufacturing Co.

TOOLS AND SUPPLIES

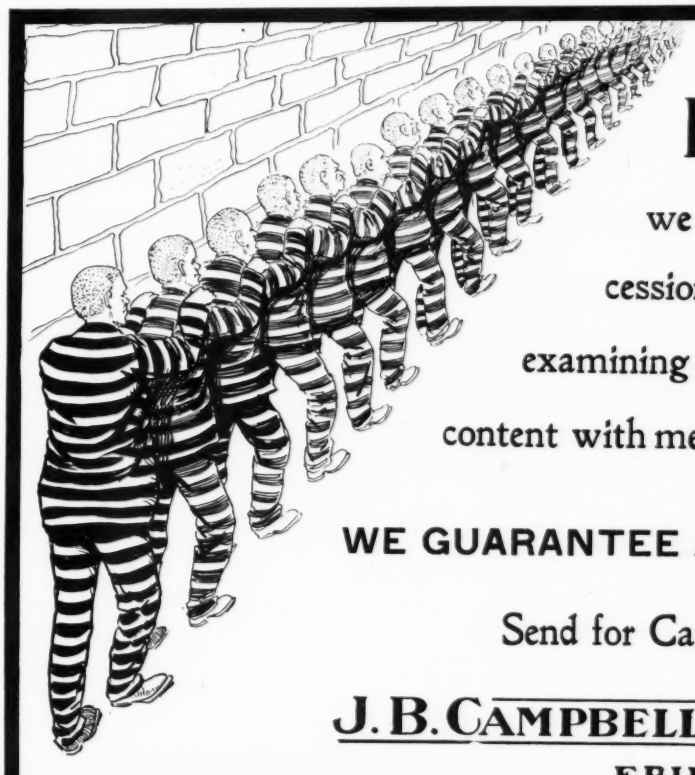
FOR STEAM, WATER AND GAS USERS

ESTABLISHED
1842

INCORPORATED
1872

128 TO 136 FEDERAL STREET
BOSTON, MASS., U. S. A.

NEW YORK OFFICE, PARK ROW BLDG.
FACTORY, SOUTH BOSTON



In some cases

we prefer to keep out of the procession and as you will find upon examining our line that we have not been content with merely following the next fellow.

WE GUARANTEE ALL OUR WORK

Send for Catalogue of Plumbers' Supplies.

J. B. CAMPBELL BRASS WORKS.
ERIE, PA.

GEM Hot Water and Steam BOILERS

EASILY AND QUICKLY SET UP
CAPACITY GUARANTEED

WE ALSO MAKE THE

ABENDROTH VERTICAL SECTIONAL STEAM AND WATER BOILERS

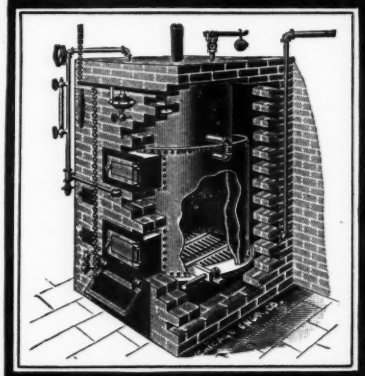
LONG AND FAVORABLY KNOWN TO THE TRADE EVERYWHERE

Write for Illustrated Catalogue

ABENDROTH BROS. 109-111 Beekman St., New York
114 High St., Boston, Mass.
Pt. Chester, W. Chester Co., N.Y

AGENTS: Crane Co., Philadelphia, Pa. Western Valve Co., Chicago, Ill.

KEWANEE BOILER COMPANY
KEWANEE ILL.



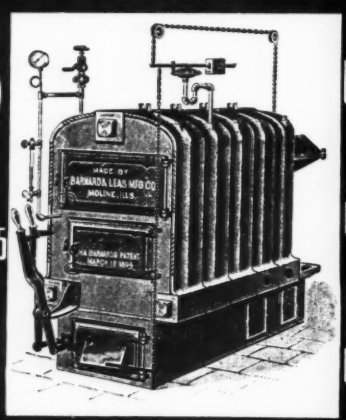
MANUFACTURERS OF
HAXTUN STEEL BOILERS FOR HOT WATER AND STEAM HEATING.

"TABASCO" WATER HEATERS
ALL STEEL SELF FEEDERS

SEND FOR SPECIAL CATALOGUES
169 LAKE ST.
·CHICAGO·

THE BARNARD BOILER FOR STEAM AND HOT WATER HEATING

ADAPTED TO ALL KINDS OF FUEL



IS ECONOMICAL DURABLE AND EFFICIENT

IS SIMPLE AND EASY TO OPERATE

SEND FOR OUR NEW CATALOGUE

BARNARD & LEAS M'F'G CO.,
MOLINE, ILLINOIS.

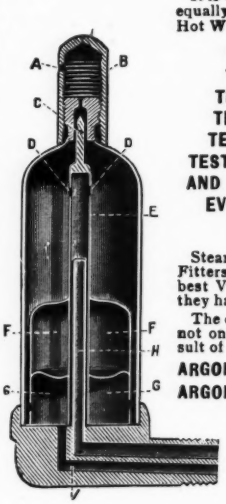
STANDS ALL TESTS

IN ORDER TO OBTAIN THE BEST RESULTS IN RADIATION IT IS NECESSARY TO USE

The Argon Automatic Air Valve

It is the only one on the market equally efficient on both Steam and Hot Water Radiators.

TESTED FOR AIR
TESTED FOR GAS
TESTED FOR STEAM
TESTED FOR WATER
TESTED FOR SERVICE
TESTED FOR PERFECTION
AND NOT FOUND WANTING
EVERY ORDER BRINGS
ITS DUPLICATE



Steam Heaters, Contractors and Fitters are not acquainted with the best Valve on the market, unless they have tried the ARGON.

The decision of experts, evinced not only in opinion, but as the result of experience, is that the

ARGON VALVES DO THE WORK
ARGON VALVES ARE RELIABLE

Need No Adjustment
Are Guaranteed

INTERIOR VIEW. EXTERIOR VIEW

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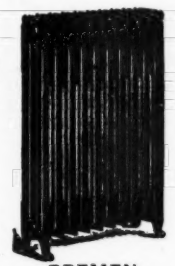
The Argon Manufacturing Company
DENVER, COLORADO.



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Our goods and prices will interest you—permit us to demonstrate this.

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Holland Radiator Co.

CHICAGO: 38 DEARBORN STREET
DENVER: 1759 STOUT STREET
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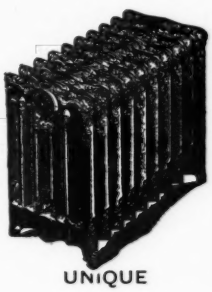
The George Worthington Company, Cleveland



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A COMPLETE LINE OF

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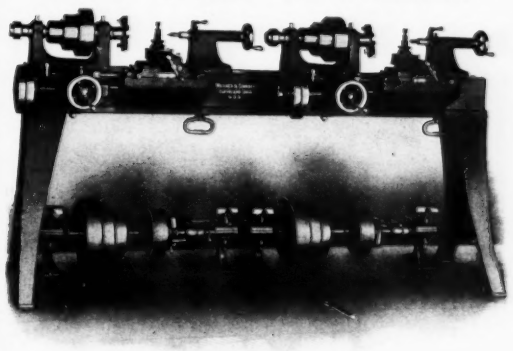

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For Turning Keys for Steam, Water and Gas Cocks.

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No Threads to Strip . No Nuts to Jam
Made of Special Wrench Steel and Drop Forged

The good qualities of Chain Pipe Wrench and Screw Pipe Wrench combined, without the faults of either.
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Cannot Slip, Crush or Lock on the Pipe.

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Handling from ⅛ of an inch Wire to 4½ inch Pipe. Price no higher than other Pipe Wrenches on the market.

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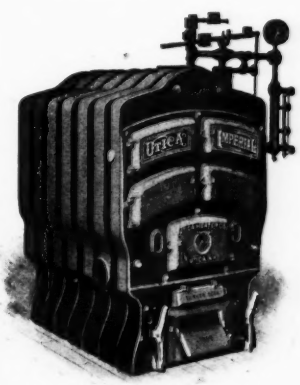

Has no Equal
Convenient to Install
Easily Operated
Economical in Fuel

New and desirable features never before employed.

Send for Circular and Terms to Agents

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FOR RESIDENCES AND PUBLIC BUILDINGS.

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CARTON AVE. UTICA N. Y.

This is Not an Acetylene Gas Machine

Ransom Automatic GAS— Machine

Produces by a new process a clean, odorless gas for lighting, heating, cooking, power, etc., at a cost less than any other process.

For Houses, Churches, Halls, Etc., It Has No Equal.

Make your own gas and save 50 per cent of what it costs you now.

The cheapest and best artificial light in the world is produced by the Ransom Gas Machine. Absolutely safe, being approved by Board of Underwriters. A 60 candle power light will not cost to exceed one-quarter of a cent per hour. Fifty cents per week will furnish sufficient gas to do your cooking. The Ransom has no equal. Agents wanted.

Ransom Gas Machine Co.

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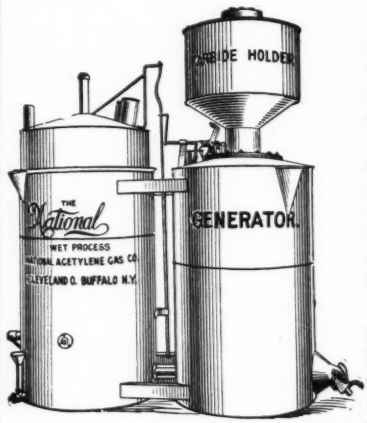

The only machine on the market which can be loaded with enough carbide to run 30 days or more without recharging. The only machine which does not produce after-generation when lights are turned off. The only machine which does not allow the gas to escape while recharging.

The carbide is fed into the water in a granulated form, thereby insuring cool, pure gas at all times. By our process of purification we are enabled to use Acetylene gas for cooking and running gas engines. The new National is fully approved by all the Boards of Fire Underwriters throughout the United States. **Local and General Agents Wanted**

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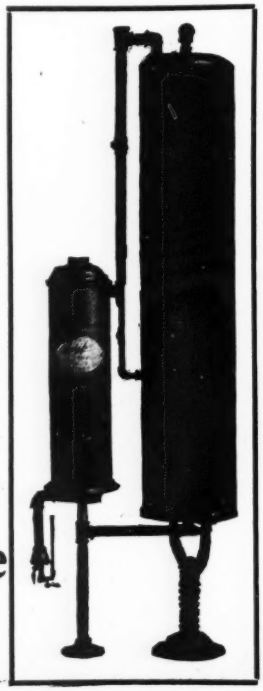
Eclipse ROUND WATER HEATERS



80 per cent

of the heat units in every foot of gas utilized with this heater.

Capacity:

a gallon per minute to a temperature suitable for bath, with smaller size heater. Made in three sizes.

Cost

less to connect.
less to operate.
less than other heaters.

Eclipse Gas Stove Company

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COLT TRADE MARK. CARBIDE FEED ACETYLENE GAS GENERATORS

Indorsed by the United States Government. The Department of Agriculture of the State of Pennsylvania says: "Safer than the usual employment of petroleum."
Entirely new principles involved. Made of the best materials, by the most expert mechanics. Guaranteed by the largest and most experienced concern in the business.

The COLT TRADE MARK Generators, are lower in price, more economical, and more easily installed and operated than any other make, and occupy one-quarter of the space.
No waste of gas; no heating. This is not true of other makes.

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Our New Heater

The Acme No. 15

Will please your trade. It heats more water with a smaller Gas Consumption than any other Heater on the market.

It is 28 inches high and 12 inches in diameter

List price, nickel plated,

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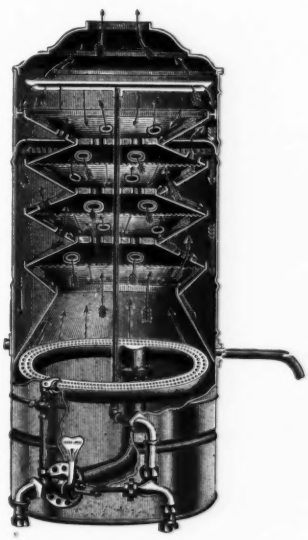
IT HAS A LARGER HEATING SURFACE CONSIDERING ITS SIZE, THAN ANY OTHER HEATER ON THE MARKET.



There are other new features that will interest you. For information about them and discounts, address

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THE EAGLE

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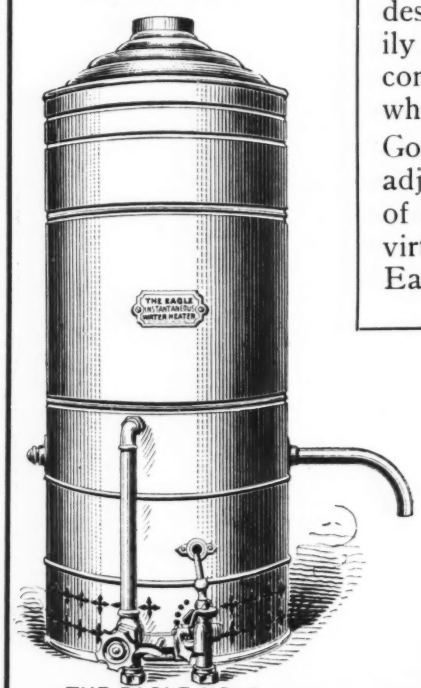

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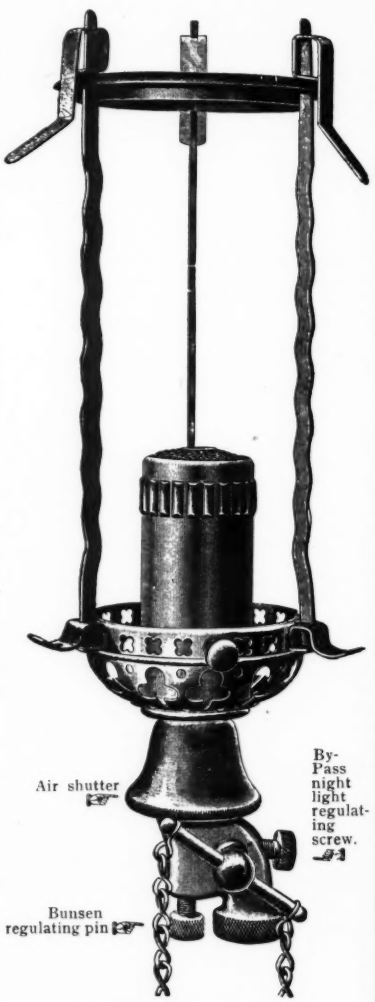
INSTANTANEOUS WATER HEATERS INCANDESCENT GAS BURNERS

Will prove themselves the favorites for 1901.

The Interlocking Valves with Safety Pilot Light, as fitted to all Eagle Heaters, insures safety in using. The only make Heater in the world wherein all parts are interchangeable.

A By-pass Burner for Incandescent Gas Lighting that readily adapts itself to the varying conditions. It is the kind that where one is tried others follow. Good light, non-clogging, easily adjusted, and the new feature of a night light, these are the virtues that are winging the Eagle to the top.



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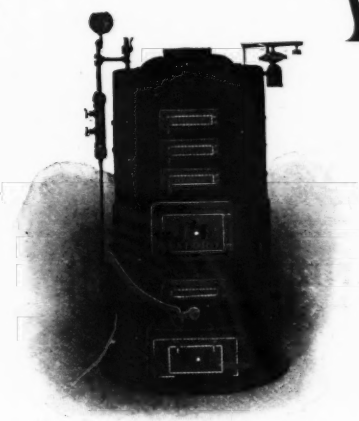
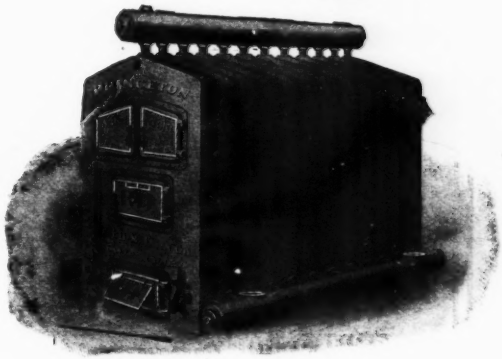


Did It Ever Occur to You?

That a bank account was concealed in the ashpit of your heating apparatus?
A big lump of coal or a small one, which?
Economy of fuel consumption is our strong point.



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For Hot Water

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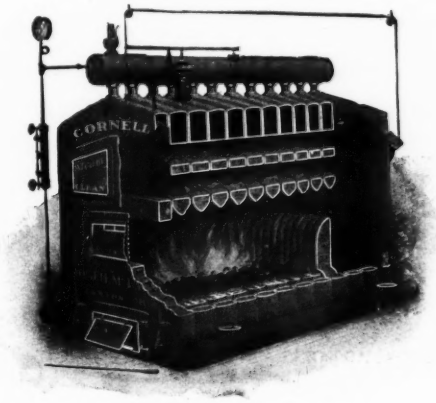

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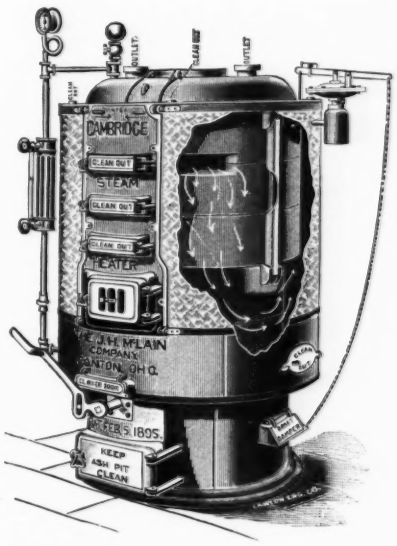
Catalogue "B" for the asking..



The J. H. McLain Company

WORKS AND MAIN OFFICE
CANTON, OHIO
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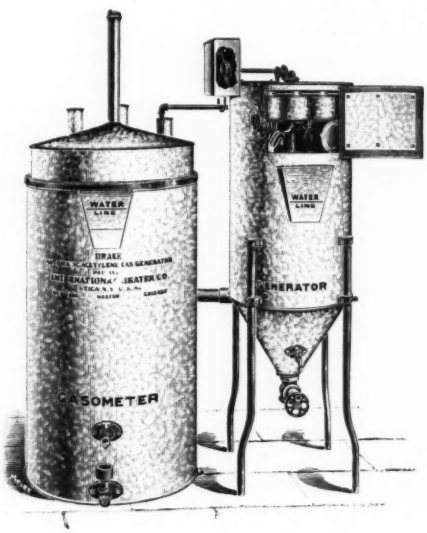
The DRAKE Automatic Acetylene Gas Generator

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

THE MOST PERFECT ACETYLENE GENERATOR EVER PLACED ON THE MARKET.



AUTOMATIC
SIMPLE
SAFE
DURABLE
ECONOMICAL

The Drake Generator is not an experiment nor does it belong to the "tin can" class of generators of which there are so many on the market. It is made on the only principle sanctioned by Acetylene Authorities and is made to last. The gas is generated under water and after passing through a second body of water and our special purifier is delivered to the burner in the highest state of purity: this means economy. If interested send for Catalogue "H" and price list.

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Largest Makers of Heaters and Lighting Apparatus in the World

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PARIS **GOLD MEDAL** **1900**

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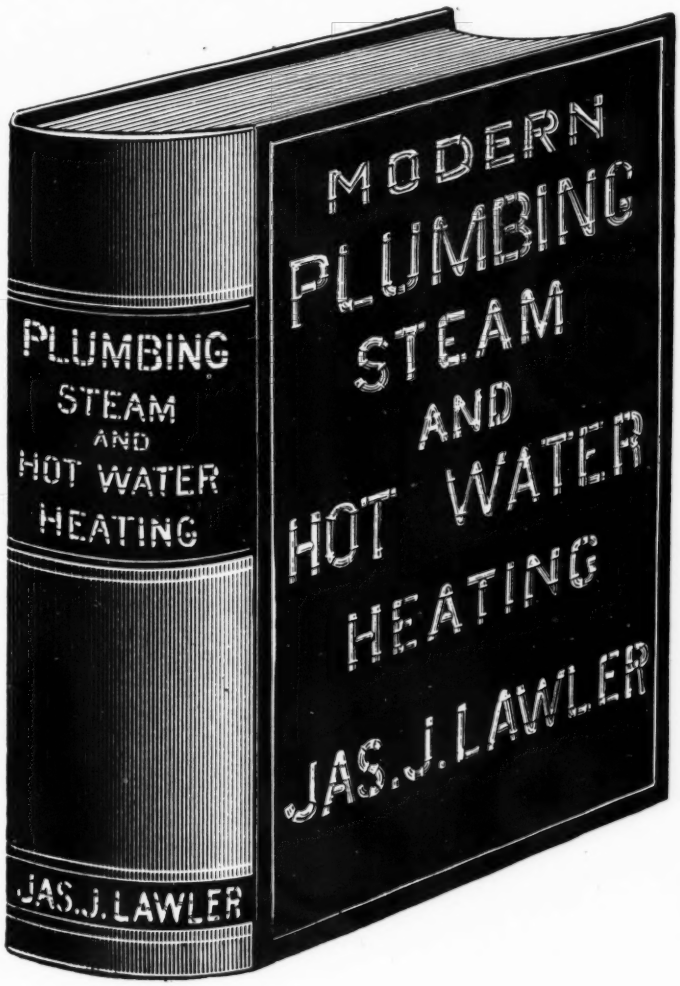

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It explains soil and waste pipe ventilation, back venting, the house trap, the fresh air inlet and their advantages. Siphonage of traps, the cause and how to remedy the same. How to test soil and waste pipes. Probable questions of plumbing examining boards, and answers to same. Hydraulics of plumbing, with original illustrations. Practical drawings and all important features in the construction of modern plumbing work.

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It tells how to correctly figure on any size or shape of building with steam or hot water. How to find the heating capacity of any shape or make of boiler for steam or hot water heating. The most practical timesaving tables ever compiled and published. A new table of how to quickly find the correct measurement of 45° angles, a most useful thing in steam and hot water construction. This has never before appeared in print.

More practical illustrations than ever published in any one volume, which shows the various systems of construction, in the heating and ventilating of buildings by the steam or hot water systems.

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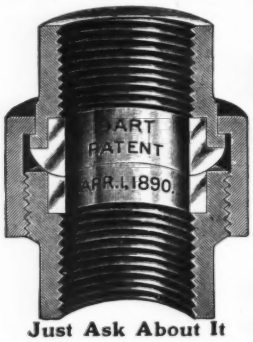

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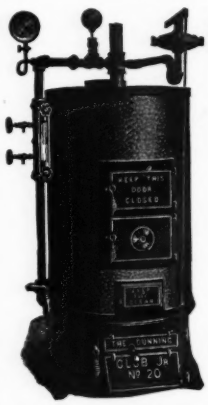

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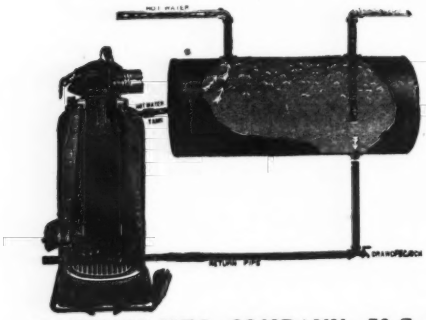

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All Steel.

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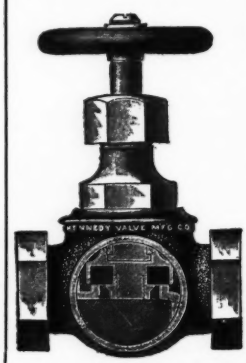

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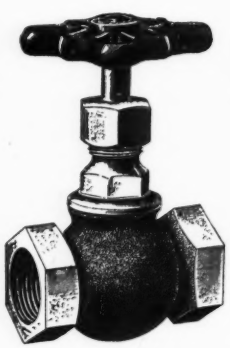

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Our Specialty

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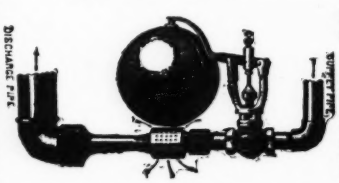
Operated by Water or Steam Pressure.



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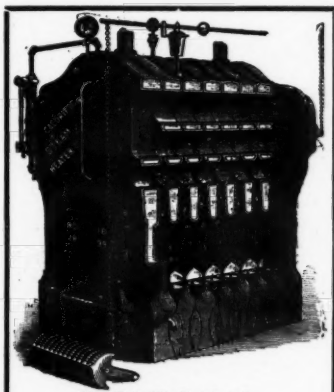

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Also make Calorific Gem and Calorific Junior.....

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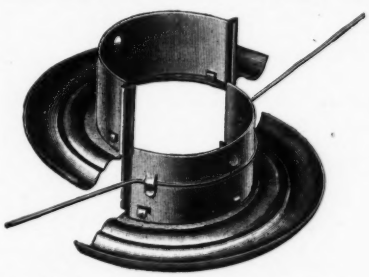

The only split plate that always stays in position; not affected by expansion of steam pipes; handsome and strongly made.

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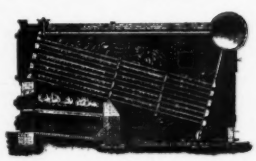

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Steam and Hot Water Boilers

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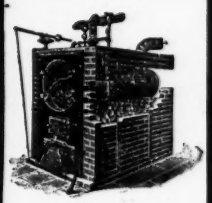

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FOR SOFT OR HARD COAL

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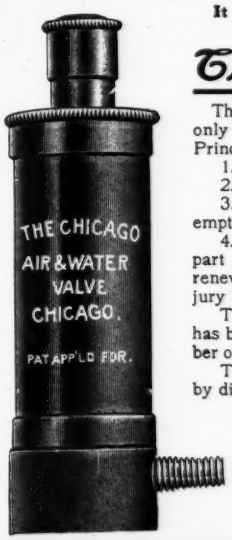

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This Steam Radiator Air and Water Valve is the only valve that has the four correct Mechanical Principles of Perfection.

1. It will free radiators and coils from all air.
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This valve is entirely automatic in action and has been severly tested, having been in use a number of years and giving perfect satisfaction.

The several features of this valve are protected by distinct patents. Other patents pending.

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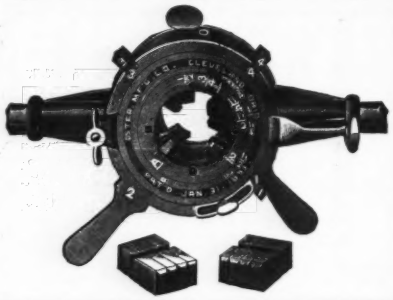

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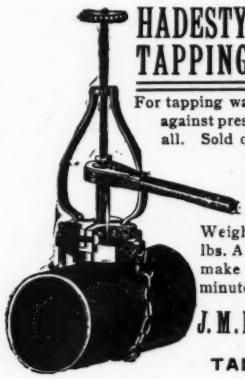

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For tapping water and gas mains against pressure. It leads them all. Sold on approval. Taps mains from 3 to 30 inches. No saddles required for different sized mains. Weight, complete, only 18 lbs. A boy 12 years old can make a connection in 15 minutes. Get prices from

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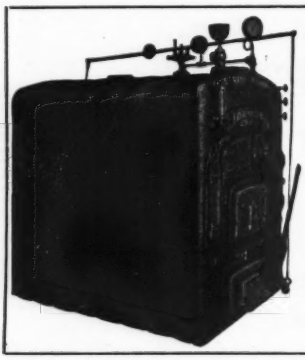

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For Steam or Hot Water (Interchangeable)

Sectional—Self Contained—Surface Burning—19 sizes—Capacities 350 to 4000 sq. ft.—Any size can readily be enlarged—Let us send you Free our new Catalogue and Fitter's Hand Book of valuable information for Practical Fitters. **Write for them to-day.**

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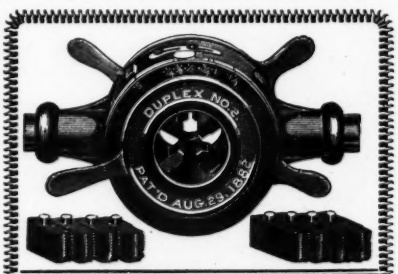

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DUPLEX ADJUSTABLE STOCKS and DIES
should be in the hands of every PLUMBER AND PIPE FITTER. DO YOU OWN ONE? Let us mail you list and quote prices : : : : :
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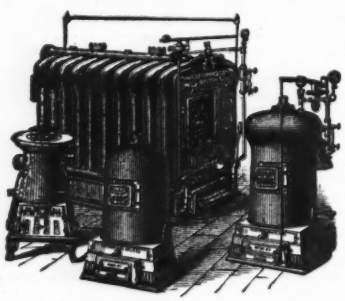

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OUR CAPACITIES RANGE IN
Square feet of Water Radiation 100 to 6,000
Square feet of Steam Radiation 200 to 3,600

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But advertise and stay,
For those who read your ad last week,
Will look for it to-day."

DIXON'S GRAPHITE COMPOUND

Is infinitely better than red or white lead for making steam, gas or water pipe joints. Joints will be tighter, and can be broken months or years after without damage to pipes or tools. IT WILL PAY EVERY PIPEFITTER TO SEND FOR SAMPLE AND CIRCULAR.

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is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, overhead, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and, while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

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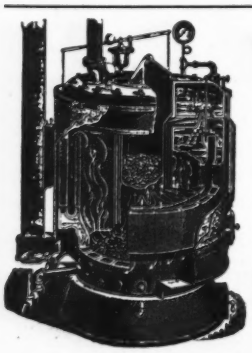

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Adapted to buildings of any kind or size. Has all advantages of hot water heating without any objectionable features. Absolutely noiseless. No pressure. No air valves. No pumps or machinery. Superior to any other system of heating and costs less. Installed by all steamfitters. : : : : : : SEND FOR CATALOGUE.

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is invariably adopted in the selection of a heating plant, viz.: Some one either makes a personal investigation, more or less thorough, of several systems, or that "some one" avails himself of such investigations already made by others, in whose judgment he has implicit confidence.

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owes its wide acceptance to the outcome of its most careful weighing by notably competent weighers. Shall we mail you its history?

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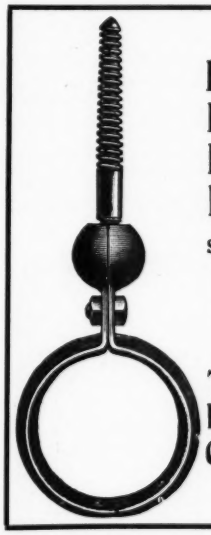

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Made of Malleable Iron. All ways the best. Carried in stock and for sale by all ::::::: Supply Houses

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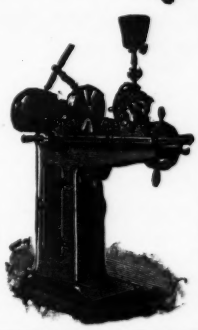
Erie Malleable Unions Copper P 'ck'g

Always ready for instant use.



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Drainage Fittings

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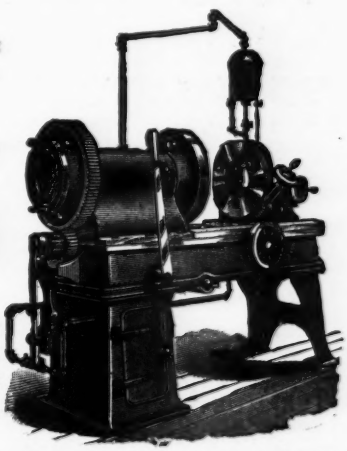

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Made in 8 sizes, cutting pipe from ⅛ to 12 in. diam.

The "Genuine" bear this registered trade mark.

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Costs less to operate than any other type of heating plant. No disagreeable odors from air valves. Every square inch of heating surface rendered effective. Steam held in radiator until condensed. Water returned to boiler at high temperatures.

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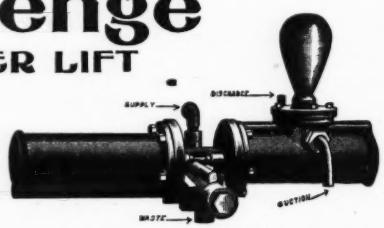
AUTOMATIC WATER LIFT

FOR TANK OR DIRECT PRESSURE.



Balanced valve. Always works.
Cannot stick. Fully guaranteed.
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Saves

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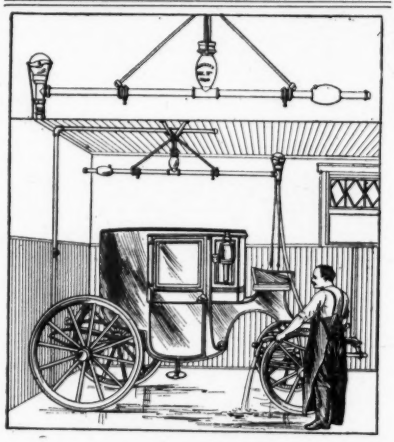

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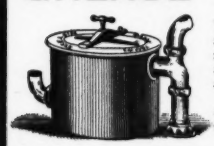

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for Range Boilers, No cumbering legs or stands.

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Prevents overcharge for water used on elevators.

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Makes quick and perfect test.

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This guard will not stop up like most others.

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Makes tight joint without breaking hubs.

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Indispensable to Plumbers

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THE S. I. J.
FOR SOIL PIPE

Sizes 2 to 6 inches. Light and Heavy.

Makes a neat job and saves your patience.

ASK YOUR JOBBERS FOR IT

This does the trick.

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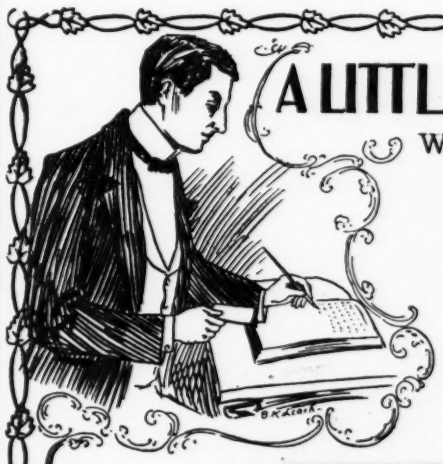

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COMPLETE LABOR-SAVING.

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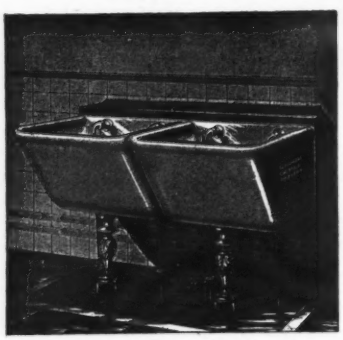

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The Sieben Floor Drains

are the best that ever. They save digging a deep ditch. Calking of joints. Extra fittings. Hours time and grief. No stoppage of sewers. No evaporated trap seal. No back water and need no vent pipe. They are made with or without back water valve. Ask your jobber or write for our new catalogue.

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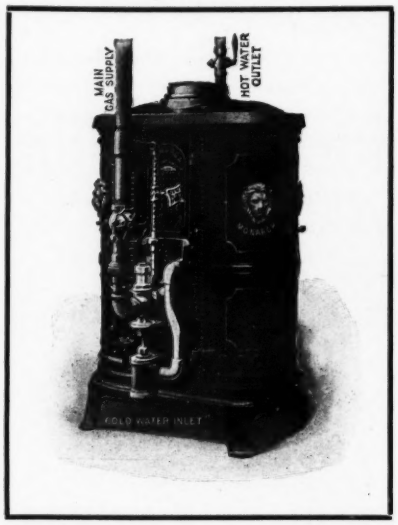
"MONARCH" LEADS



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Send for Catalog fully illustrated and you will be convinced.

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THEORY AND PRACTICE OF

LEAD BURNING

By the Autogenous Process
OR HOW TO SOLDER WITHOUT SOLDER

With full instructions to the amateur in the details of the machine and the management of the gases, with valuable suggestions and directions for practice

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Frost Proof Automatic Water Closet

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ROCHESTER, N. Y.

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THAT IS WHY

Advertisers get results

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BOSS WASHER

TAKE NOTICE
No Boss Washers are Genuine that do not have the inventor's name "ANDREW BELL" on Label of box.

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ONE OF THE
TWENTY FIRE POTS

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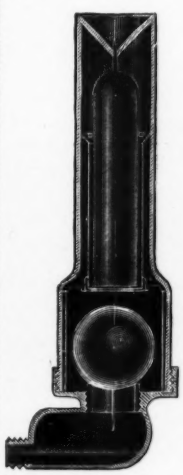
TWENTIETH CENTURY AIR AND VACUUM VALVE



Is a positive seal against the return of air to the radiator through itself, and enchances the value of a low pressure steam heating plant fuly 50 per cent, while it materially reduces the coal bill.

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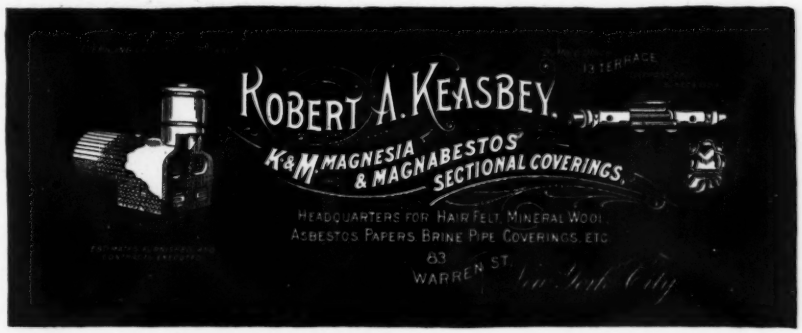
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will repair leaky boilers, piping, etc., it will withstand fire, water, steam and oil, it expands and contracts the same as iron. Write for catalogues and prices.

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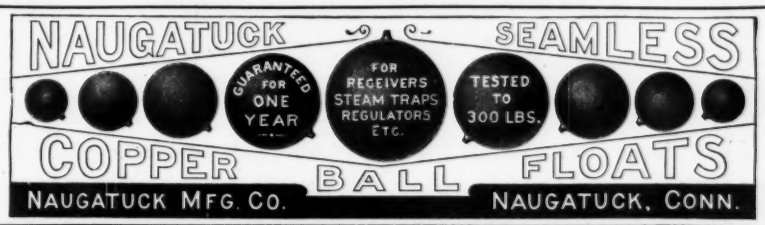

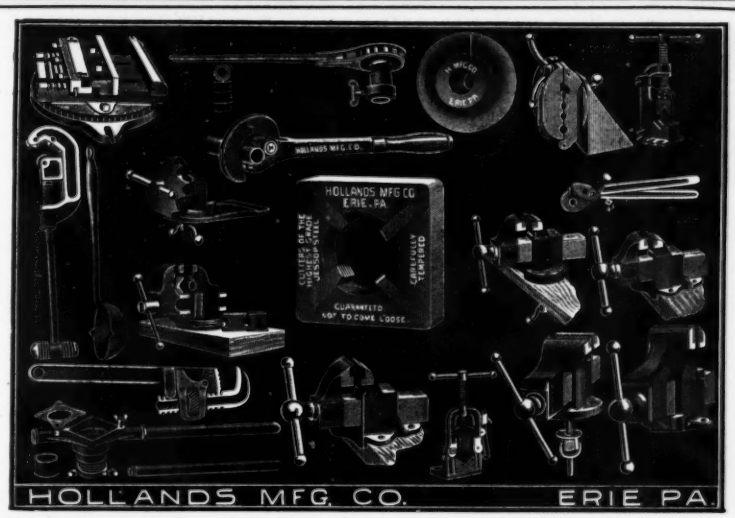

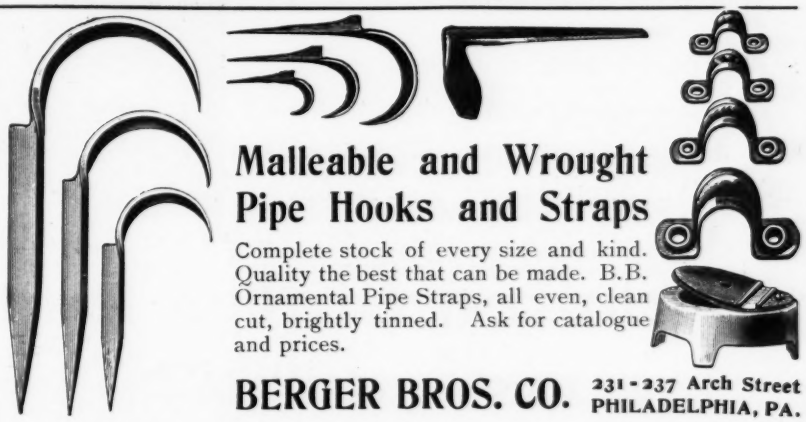

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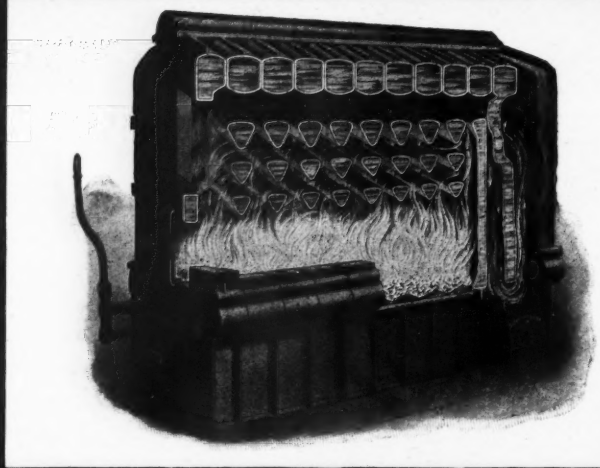
FOR STEAM AND WATER HEATING.



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ECONOMICAL,

QUICKLY SET,
TIGHT JOINTS,
EASILY MANAGED.

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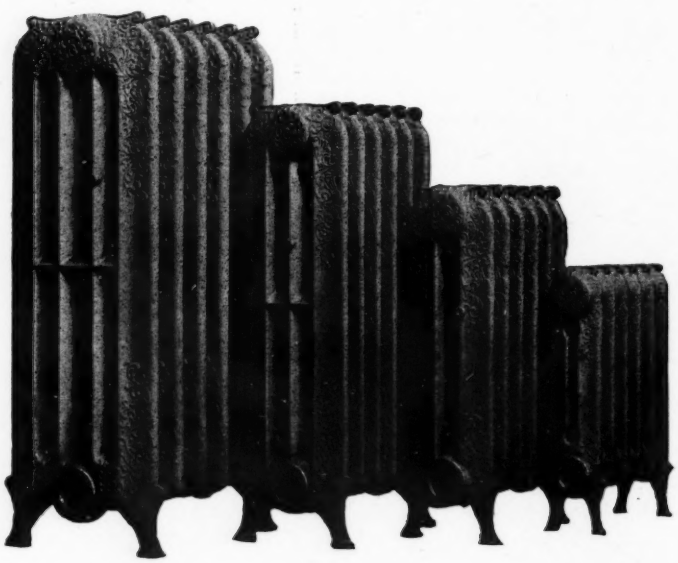
Triton Radiators

and this is the first view we have ever had of the different widths together. Our new catalogue just out tells all about all of our radiators. Ask for one.



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New England Agency:
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DOMESTIC ENGINEERING

Plumbing : Heating : Lighting :: Ventilating

Whole No. 140 *JUNE FIFTEENTH, NINETEEN HUNDRED AND ONE* *Vol. 21, No. 3*

Plumbing and Household Sanitation—XI.

A Course of Lectures which, when completed, will cover the theory and practice of the art

By J. Pickering Putnam, of Boston, Mass.

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Copies of issues of Domestic Engineering containing the nine previous installments may be had at 20 cents each.

Capillary Action.

Besides the well-known enemies of the water-seal of traps already described, another exists, which is, however, more insidious and no less fatal in its action. It works like the vampire, silently and stealthily, drawing the life from the trap without warning of any kind, and often leaves open the gates of the sewers without detection. Where the trap is constructed entirely of opaque material, the absence of the water-seal cannot be seen, and where glass is used it soon becomes coated with an opaque film, so that the source of the leakage of sewer air into the house cannot be seen, and as capillary action is unsuspected, the presence of sewer air is attributed to some other cause.

Capillary action is the subtle thief which does this mischief. Hairs, lint, bits of twine, paper, sponge, or matted fibrous filth of a great variety of kinds, are the tools with which it operates. A small quantity of any of these substances forming a continuous mass or chain from the water in the trap to and over into the outflow, will, under certain conditions, soak up and slowly drain off the water from the trap until the seal is destroyed. Let us examine the conditions favorable to this action, and ascertain by what means, if any, it may be prevented.

In books on the subject of capillarity we find the theory explained with scientific accuracy. The precise amount of elevation of liquids in tubes of very fine bore, nominally of the diameter of a hair (capilla) is calculated in these treatises to a nicety, and we are in some of them referred for complete satisfaction and elucidation particularly to the gigantic work of La Place on "Celestial Mechanics" (tenth book, supplement). Knowing from the study of this interesting work that the tension of the surface of contact of two liquids or bodies is represented by the equation:

$$T_{12} = \int_0^{\epsilon} (x_1 - x_{12}) \rho_1 + \int_0^{\epsilon} (x_2 - x_{12}) \rho_2 d v_2,$$

What more need the practical plumber have to cause the whole subject of the capillary effect of sediment in traps and the best methods of dealing with it to burst upon his delighted understanding in a flood of light? All he requires is a knowledge of the higher mathematics and some skill and ingenuity in arranging his data for calculation. He knows from the treatises that the finer the bore of the tube the higher the liquid will rise in it, provided the surfaces are of a kind the liquid can wet; that plane surfaces which can be wetted by a liquid will exert a similar attraction on liquids, provided they are put near enough together, not exceeding 1-10 of an inch apart, and that the attractive power is in proportion to the proximity of the surfaces and independent of the thickness of the bodies underlying them. But he will not find in the treatises what the exact effect will be on liquids of the interposition of numerous plane and rounded surfaces such as are presented by the sediment found in traps, under the peculiar conditions of surroundings, temperature and moisture met

Fig. 1. Capillary Action Forming Short Siphon.

with in plumbing. Inasmuch as these peculiar conditions would render his calculations somewhat more complicated and difficult, and as the books have not investigated the subject sufficiently, a study of this particular branch of the subject from a practical rather than a theoretical standpoint seems needed.

What is the capillary effect of large and small quantities of the sediment found in traps, and how can the loss of water by this agency be prevented?

It is evident, first, that the substances exerting the capillary action can conduct the water only to a certain limited distance above and beyond its surface, and that the rapidity of the removal of the water in a closed vessel will be in proportion to the shortness of the distance required to be raised; second, that capillary action in an open vessel greatly increases the loss by evaporation, and that the rapidity of the removal of the water in vessels of similar form but exposed to different degrees of change of air will be in proportion to the velocity and hygrometric condition of the air currents. Hence, if we use a trap having a seal of sufficient depth, and do not allow the air above the trap to be changed in such a manner as to cause evaporation, aggravated by the spreading out of the water through capillary action, the trap will be secure against loss of seal through this agency.

To ascertain the distance which water will travel above the seal of a trap under the influence of capillary action, a number of experiments were made with various materials, such as are liable to collect in traps in practical use, including among them those which are found to have the maximum of effect in conducting the water by capillary action. The experiments were made both in ordinary open glasses and in different kinds of traps, both open and closed.

The first tests were to ascertain the perpendicular distance. Figures 1 to 4 show the manner in which I made the tests with ordinary goblets. A number of these glasses were supported on blocks and filled with water. Over their edges were hung the different substances to be tested, one end extending below the bottom of the water in the goblet, and the other to the top of a tumbler placed below it, as shown in the figures, to receive the water drawn from the goblets. The substances tested were matted hair-felt, lamp-wicking, both with and without its covering; jute; hemp-cord, unraveled and separated into fine fibres; hemp-cord in its natural braid, and pieces of string. Of all the substances tested, jute, such as is used by plumbers in caulking joints, proved to be the most effective in removing the water by capillary action, and

Fig. 2. Capillary Action Forming Longer Siphon.

this is the substance I shall use in our tests to-night. Different amounts of each substance were used in making the experiments. In each case experiments were made both with a small quantity of each material and with a mass large enough to completely fill the waste pipe. As might be expected, the water was most quickly removed when the quantity of the substance tested was large enough to completely fill the pipe. These experiments showed the limit of the carrying power in an upward direction with these materials under capillary action to be 4½ inches. The water was rarely lifted more than 3 inches or 3¾ inches. The majority of the water carried into the lower glass was moved during the first ten or twelve minutes, the rapidity of the action gradually decreasing as the water descended, becoming extremely slow when the level was reduced about 2 inches, and generally ceasing altogether and the fibres becoming entirely dry at the top when the water in the upper vessel was reduced about 3½ or 4 inches.

In emptying a vessel of water by means of a bent tube forming a siphon, the excess of length of the outer over the inner limb of the siphon governs, as I have shown, the rapidity of the flow. With capillary action, however, though the outer limb must always be longer than the inner, yet beyond a certain fixed point the excess appears to have no marked influence. A small predominance of the outer limb as shown in Figure 1, or just enough to overbalance the column of water in the inner limb, carries off the water as rapidly as the long limb shown in Figure 3.

The results of the experiments with ordinary open vessels were as follows:

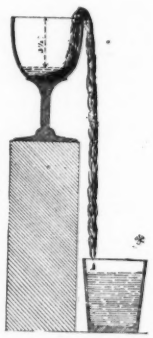

Fig. 3. Capillary Action with Long Siphon.

(a) Hair-felt. This is a material which closely resembles the matted deposit of short hairs which form so large a proportion of the deposit in traps and waste pipes. Strips of this felt one-quarter of an inch thick and of various widths and lengths were tested under different conditions. Tested with the glasses arranged as in Figure 1, with a strip three-quarters of an inch wide, it lowered the water in the glass 2 inches in the first ten minutes, but required four hours and a half to diminish the level another inch. After this no more water was carried over into the lower vessel, but the rate of evaporation of the water in the goblet was considerably increased by the hair-felt, which lifted the water to a certain height and distributed it over the fibres of the felt, thereby exposing a very large surface to the action of the air. A piece of felt 2 inches wide tested in a similar manner gave similar results. An increase in the width or length of the felt did not make, in this case, an increase in the amount of the water transferred from the upper to the lower vessel corresponding to the increased size, but increased the velocity.

Fig. 4. Capillary Action with Horizontal Extension.

(b) Lamp-wicking. A material closely resembling the soft, porous lint formed in traps and waste pipes. This was tested both with and without its cylindrical fibrous covering, as it comes prepared in the market for use in lamps. The wicking was cylindrical in form and about ¼ inch in diameter. It was first tested without its cover. Placed as shown in Figure 1, the wicking lowered the water only 1¼ inches in seventeen and one-half hours, after which no further transfer took place. Placed as in Figure 3, 1¾ inches were transferred in the same time. With the wicking covering on, only half the amount of water was transferred in the same time.

(c) Jute. A hempen, unwoven cord, with long, fine fibres, used by plumbers in caulking. This substance produced the strongest capillary action, and acts like very fine hair and lint. Arranged as in Figure 1, a piece ¼ inch in diameter transferred 1½ inches in fifteen minutes and 2½ inches in four and three-fourths hours. Another piece, 1 inch in diameter, transferred 2 inches in fifteen minutes, and the whole 4 inches in four and three-fourths hours. Another piece, supported as shown in Figure 2, raised the water 4½ inches, after which the lower end of the long arm dried up, and what water was thereafter raised from the goblet was carried off by evaporation, but not transferred to the lower glass.

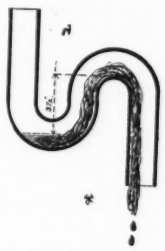

Fig. 5. S-Trap having its Water Seal Destroyed by Capillary Action.

(d) Hemp-cord, unravelled and separated into fibres, was in no case able to raise the water above 4 inches from its surface.

(e) Twisted or braided, as it comes in cord for the market, it could not transfer more than 2 inches from glass to glass.

(f) Pieces of linen twine (eight pieces) could not transfer more than ¾ inch.

Beyond these points the various substances invariably dried up at their lower ends, after which, of course, whatever water was taken from the upper vessel was removed by evaporation.

Tests were then made on various similar fibrous substances, both in the manner described and also enclosed in small, ¼-inch bent lead tubes, to prevent evaporation from effecting the action. In no case, except with sponges, could the water be raised over 3½ inches, and rarely over 3 inches by these substances. The outer arms dried up before the water in the upper glasses was lowered 3 or 3½ inches. Without the lead tubes, the outer arms dried up sooner than with them, hence less water was carried over into the lower glasses, but more was lost by evaporation. The loss of water was greater without the tubes, but the action was slower, since the drying up of the outer arms prevented the rapid removal by the combined capillary and siphoning action.

Fig. 4 shows the manner in which tests for the limit of horizontal and inclined distances were made. It was found that an increase in horizontal distance facilitated the drying of the mass, and therefore correspondngly diminished the siphoning action.

I will now place pieces of jute ½ inch in diameter in each of the three glasses on the table, just as you see them represented in the picture, and in a few minutes we will observe the action they have produced. The water stands in each goblet exactly on a line with the top of the glass.

From the experiments I have so far described, and numerous other tests made in the same manner, we learn that the extreme limit of the lifting power of very small quantities of the long, fibrous substances which might lodge in traps so as to exert a capillary action is within three inches. Sponge is the only substance known to the writer as likely to be found in waste pipes which has a lifting power exceeding this. The limit of sponge, even in large masses, appears from the tests made at the same time with the others, to be 8 inches; but as the general shape of a sponge is spherical, and never filiform, and as no sponge large or long enough to extend upwards this distance or anything approximating it, and then down again the same distance into the waste pipe, could possibly be squeezed into a trap without stopping up the waterway altogether, the consideration of this material and all others of similar form need not enter into our calculation.

Tests with Traps.

Thus far the experiments have been made in the open air in ordinary open vessels. The tests were made in the shade, and in a temperature varying between 60 and 70 degrees F., or the ordinary temperature of house interiors. To render these results of more practical value they should be compared with the tests made on the same materials in the actual positions found in practice—i. e., in the trap itself. The test were, therefore, made both in detached traps and in traps fixed in position and properly attached to the drain pipe.

Tests with Ordinary S-Traps.

A 1½-inch S-trap having 1½-inch seal was arranged as shown in Figure 5. A string of jute ¼-inch in diameter was introduced so as to extend from the bottom of the trap over the outlet and down several inches below the bottom. The experiment was repeated five times, the results each time being nearly identical. In the first half minute the water in the trap was lowered ½ inch. Five

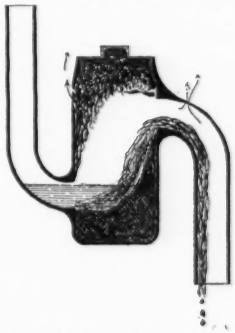

Fig. 6. Pot Trap losing its Seal through Capillary Action.

minutes sufficed to lower it 1 inch, twenty minutes 1¼ inches; a half-hour usually sufficed to break the seal, and about three hours was enough to leave the trap almost dry.

The quantity of jute was afterward increased to 1 inch in diameter, which was the maximum possible, inasmuch as it was sufficient to fill the trap as full as it could ever possibly get in practice. In every case enough water was drawn out of the trap to break the seal in less than half an hour. Two minutes generally sufficed to lower the seal an inch. Hair-felt emptied the trap in from nine to fifteen minutes.

Tests with Pot-Traps.

A number of pot-traps were then tested. An 8-inch pot-trap having 3⅛-inch seal was arranged as shown in Figure 5, the mass of jute being 1 inch in diameter. It required twenty-four hours to lower the water 1¾ inches. Two days reduced it 1 13-15 inches; three days, 1⅞ inches; seven days, 1 15-16 inches. After this no further change took place in the trap. Evaporation was too slow to make any perceptible difference in several days, since the trap was not ventilated.

A vessel of water of about the same size and form with the 8-inch pot-trap, but freely open above to the air, so that evaporation could go on, and having a piece of jute 1½ inches in diameter hanging over its edge, as in Figure 1, lost 5 inches of water in five days. A portion was carried over as in the 8-inch pot-trap into the vessel below, but the rest was removed by evaporation hastened by the capillary action.

A 6-inch pot trap similarly arranged lost 2⅛ inches in one day, 2 5-16 inches, 2⅜ inches and 2 7-16 inches, in two, three and five days, respectively, after which no apparent further change took place, the experiment lasting several days longer.

A 3½-inch pot lost ⅝ in, 1 inch, 2 inches, 2¾ inches, 2⅞ inches and 3 inches in one, six, fifteen, forty-eight, seventy-two, 144 hours, respectively, after which no further change took place.

Thus we see that the effect of capillary action in traps detached from the drains is similar to that in open vessels, with the exception, that in traps unventilated no perceptible loss took place through evaporation and that after the limit of perpendicular distance at which the capillary force can act has been attained, no further loss of water is perceptible. In open vessels, on the contrary, the draught on the water goes on indefinitely by rapid evaporation aided by the distributing process effected by the capillary action.

Tests of the Effects of Capillary Action in Ventilated and Unventilated S-Traps Fixed in Position.

To test the loss by capillary action on ventilated S-traps as compared with the loss on the same when unventilated I attached an S-trap having a 4⅝-inch deep seal to a branch waste entering the soil pipe, after having half filled the trap with jute as shown in Fig. 5. With the trap unventilated the loss by capillary action was as follows: In the first five minutes ½ inch; in the first forty-five minutes 1 inch; in twenty-four hours 3 inches; in three days 3¼ inches; in four days 3⅜ inches. Thereafter no further perceptible change took place. It made no perceptible difference whether the basin side of the trap was opened or closed, showing that evaporation in an unventilated trap is practically imperceptible.

The experiment was then repeated on the same trap, ventilated at the crown, into a cold flue with the following result: In one hour 1⅛ inches had been removed; in 5 hours 1⅞ inches; in 22 hours 2½ inches; in two days 3¼ inches; in 3 days 3½ inches; in 4 days 3¾ inches; in 5 days 4 inches. Thus the loss continued at the rate of about ¼ inch a day by evaporation, after the outer end of the jute mess had entirely dried up. This rate of evaporation was nearly double what it would have been had it not been assisted by the capillary action. From this we see that ventilation greatly increases the danger arising from capillary action, often rendering the latter dangerous in cases where, without ventilation, the seal would not have been broken.

To test this point still further I placed two ordinary drinking glasses, filled with water side by side. The first was treated as shown in Fig. 2, with a mass of jute hung nearly 5 inches above the surface of the water and having one end immersed in it as shown in the figure, the other extending below the bottom of the glass. Owing to the height from which the jute was suspended the water did not rise to the point of support; consequently the outer arm was dry, and whatever loss of water was observed was, therefore, due to evaporation.

The glass having the water alone lost by evaporation only ¼ inch in seven days, while that having the jute lost 1 inch, or four times as much in the same time. This was in air almost perfectly motionless. Had the air been in motion as it is in the current over a ventilated trap, it is evident that the difference would be proportionately greater.

Friction.

A consideration of very great importance in trap construction and arrangement is the amount of retardation to the passage of the waste water caused by the friction against its interior surfaces.

In order to obtain the quickest delivery and maximum of scouring action on the waste-pipes below the trap, it is important that the trap should afford the minimum of obstruction to the flow of the water. Many traps, especially gravity-ball and other mechanical traps, are so formed as to greatly retard the flow of the water. With many ball-traps, when the water is permitted to escape from the fixture through the waste pipe "full-bore" above the trap, the ball is so forcibly driven against the outlet mouth of the trap as to very seriously obstruct its further passage, and prevent its exerting its full scouring effect on the pipe below.

An ordinary S-trap offers the least resistance to the flow of the water, the gravity ball trap the most, if we except certain forms of mercury-seal traps.

An ordinary bath tub arranged as shown in figure, will discharge through 1½-inch waste pipe, 9 feet long, descending perpendicularly and without a trap, at the rate of 1.4 gallons of water per second.

An ordinary unventilated 1½-inch S-trap, with a seal 1½ inches deep will retard the flow only 23 per cent, or it will discharge at the rate of a little more than one gallon a second.

Another 1½-inch unventilated S-trap emptied the tank at the rate of 1.1 gallons a second.

The same trap ventilated prolonged the time of emptying the tank from 90 to 113 seconds, thereby retarding the flow 23 seconds or 26 per cent. The ventilation also created a loud and somewhat terriffic roar during the entire duration of the discharge caused by the suction of the air at the vent opening. Without any trap, the tank discharged in 73 seconds. With a hinged valve trap, unventilated, it required 126 seconds. With the same trap ventilated a very much longer time or 163 seconds was re-

quired; the ventilation retarding the flow 37 seconds or 30 per cent.

A 4-inch pot trap, unventilated, required 104 seconds. The same ventilated required 144 seconds, or 38 per cent.

A 4-inch bottle trap, unventilated required 94 seconds. A gravity ball trap required 226 seconds.

In both of these ventilation reduced the flow from 30 to 35 per cent, by calculation.

Thus we see that the average retardation of the discharge from a bath tub, and the consequent loss of scouring effect, caused by ventilation, is very great and amounts to about 30 per cent, or nearly a third of the whole when the vent pipe is very short. When a long vent pipe is used the percentage of loss is somewhat less. The discharge of a wash basin having an outlet large enough to fill the waste-pipe "full-bore" gave similar relative results for different traps.

Summary of Ten Objections to Special Ventilation.

I find, therefore, no advantage whatever, in trap ventilation. The disadvantages, however, are very serious and may be summed up briefly as follows:

(1) It destroys the trap seal by evaporation when applied at or near the crown. With S-traps this position of the vent is necessary to prevent self-siphonage.

(2) It can not always protect the trap from siphonage even when newly applied in the most approved manner. Siphonage is sometimes so strong that it will collapse a galvanized iron pipe as it did in the Worcester tests, or it will crush almost flat a cesspool trap as shown in our Fig. 2.

(3) It increases the unscored area of the trap, making it a cesspool. It is a very strange piece of inconsistency to condemn the cesspool trap on account of its unscoured chamber and yet adopt in its place a ventilated S-trap, because by so doing the very thing we wish to avoid is reproduced in an aggravated form; the mouth of the vent pipe forming a sediment chamber which is not only greater in extent of surface, more easily fouled and less easily cleansed than that in the pot trap, but one which is far more dangerous in as much as its fouling, even to a limited extent, involves the destruction of the whole system. I have found by repeated test that the water discharged from a large outlet basin and trap placed where it should be near the floor, is thrown up from 10 to 18 inches into the vent pipe at every discharge. Thus a large sediment chamber is formed which has an area of nearly 100 square inches. Beyond this, congelation of fatty vapor fouls to an indefinite extent, and it is no uncommon thing to hear of a vent pipe filled with grease for several feet above a sink trap.

(4) It retards the outflow of the waste water and its consequent scouring effect about a third.

(5) It complicates the plumbing and adds to the danger of leakage through bad jointing and increased material.

(6) It aggravates the danger arising from capillary action.

(7) It increases the corrosion of branch wastes by retarding the rapidity of flow and scouring effect allowing sediment to collect more rapidly than it otherwise would, and brings soil pipe and sewer air in contact with the branch wastes to take the place of the pure air of the house, which follows every discharge of the fixture. Moreover, as soon as the mouth of the vent pipe begins to get clogged by sediment and grease, the air current it was intended to produce is partially or wholly arrested, and we then have an interior surface of foul piping equally exposed to corrosive action with the unventilated pipe, but more than double in quantity.

(8) Finally it seriously increases the cost of plumbing, an increase which amounts to as much as from five to ten per cent on the total cost of the plumbing in new work, and indefinitely in old work in which the trap ventilation sometimes becomes by far the greatest part of the work to be done.

The Architect in His Relation to the Plumber.

By James Allison, of Cincinnati.

IF there is any one thing that we can be said to know better than another it is the fact that, in all ages of the world, and in every state of human development, man has been subject to the same natural laws. That is, his respiration, assimilation, nutrition, and excretion have not been materially changed, either by legislation or civilization. True, it does not require a very large amount of knowledge to realize this; but it is always wiser to know a little and know it well, than, like a bubble, inflated with too much knowledge, suddenly collapse into ignorance. We are able to assert, therefore, without fear of contradiction, that city ordinances have never been able to control digestion, nor change either the quantity or quality of many excretions, the removal of which must be provided for in some way. We are so certain of this, that, while we admire the majestic ruins of ancient cities, and are lost in wonder at the stupendous evidences, not only of the existence of a swarming population, but also of superior mechanic arts, we require no peculiar inspiration to enable us to determine with equal certainty the co-existence of sanitary science. Because nature's laws in every age and among all people have required that provision be made for the waste and excreta of the body and a proper supply of food, water and air; we also know from experience that the larger the number of people collected together in communities, the more imperious becomes the demand. But those ancient people, together with their arts and civilization, have passed away, leaving us only the magnificent remains of their marvelous architecture, from which to conjecture the extent of the sanitary science required in order to have preserved the general health and supplied their densely populated cities with the necessary water, air and sewerage.

We hear of the architects—for many of them put their mark on their work, or had their faces chiseled in the marble—but nobody appears to have remembered the plumber.

Is it possible that history has always been repeating itself in its neglect of that worthy class of citizens? Yet we are confident that the great Teta, the architect of the Pyramid of Cheops, and the twenty-two architects whose names are preserved in Egypt, Baalbec and Thebes, to say nothing of those who designed the palaces and monuments of Palenque and Uxmal, the Hanging Gardens of Babylon, or the convenient dwellings of Ninevah, must have had the aid of the sanitary plumber. We say must, unless indeed those ancient architects were better or differently educated in sanitary science than we know them to be now-a-days. Be that as it may, their sanitary arts and science, together with the first-born children of the plumbers got lost, so long and so badly as to leave no records behind them.

After the fall of the Roman empire, man drifted into the darkness of superstition and ignorance; science was forgotten and the arts abandoned. Whole communities neglected the simplest laws of cleanliness and hygiene. Pestilence and death stalked hand in hand over the earth, sweeping away its millions of appalled and helpless victims with resistless fury and persistence. The mere recital of the ravages of the terrible plagues which devastated Europe in our era fills us with horror and astonishment. As imperfect as our modern sanitation of cities may be, we can scarcely imagine, in a civilized city of the first class, a plague like that of Egypt in 1792, which destroyed 800,000—or in Barbary in 1799, with a death rate of three thousand per day—or Bassora in Persia by which eighty thousand perished, and all from causes now considered within the easy remedial reach of sanitary science. The great pestilences that nearly depopulated Europe during the sixteenth and seventeenth centuries became the cause of a revival, or rather the creation of sanitary science; for, when investigation had brought to light the terrible conditions by which the evils had been produced, men began to realize the accumulated horrors of the situation and the imperative necessity of a remedy. The next natural step was to formulate the results of experience into a science, which was done; and so well was it done that the average health of cities has been vastly improved, and duration of human life prolonged, and we have done it all ourselves, without the aid of the ancients. It is a source of some pride that sanitary science, with its long train of useful arts to ameliorate human conditions, is exclusively of our invention. It is true we were forced to it by a necessity which knows no law—excepting the laws of nature—of which self-preservation happens to be the first. But still we have accomplished our duty, as well perhaps as any other department of science, having for its object the advancement of man's physical welfare. By we—I mean the plumber in contradistinction to the architect—with a proper regard for the proverbial modesty of the workers in the lead, and due deference to the grandeur and dignity of architectural achievements—we humbly submit that the modern improvements in the arts of sanitation are due to the labors and experience of the long-suffering plumber, rather than the intellectual efforts of the artistic and skilled architect. The inference is therefore clear that in the onward march of sanitary science the time has arrived when the plumber should take his place in the procession to which he is by right entitled as minister in chief.

In the necessary and logical order of things, custom has long since entrusted the sanitary welfare of the community to, and held responsible for short-comings, the man who does the work. The architect, however learned and skillful, may design palaces, and princes may have them erected, which, but for the art of the sanitary plumber, would become reeking hot-beds of disease and pestilence. It is to the plumber and not to the architect that all questions arising from defective drainage, sewerage and ventilation are referred, and, whether justly or unjustly, he is alone held responsible for the evils of bad plumbing and too frequently made to bear the blame for the sins of others. Now, the grand object of organized agitation of the subject by our guild is, so far as possible, to remedy the evils and elevate the sanitary art in behalf of the public as well as ourselves. Our desire is to render the plumber competent to meet the varied duties and responsibilities, not only presupposed but made necessary by the practice of his art. In brief, to make himself a worthy executor of an honest art and dignified science, and even to invoke the aid of legislation in order more effectually to ensure results. In order to achieve this, it is necessary that the working army of reform be properly disciplined and officered. Our relations with the architect, builder and doctor, should be clearly defined, and each class be made to bear their respective burdens. Our present affair is with the architect and our duty is to examine dispassionately the relations we occupy with him and decide what changes are necessary, if any.

Presupposing that the educated plumber is his own sanitary engineer, it is evident that to him will be referred all questions of drainage, sewerage, lighting and ventilation, and, especially, the practical methods whereby the best results are to be attained, all of which are but incidental to the studies of the architect, while they constitute the life and business of the plumber. Let us look into the facts a little. The investigations of science into the causes of pestilence, and the search for remedies, from which investigations sprung sanitary science, revealed facts no less curious than important. Recognizing the great central fact that all matter is but the different arrangement of a few simple elements, into the absolutely innumerable forms of use and beauty, and that from the least to the highest form of organized matter each is but a laboratory which changes the material arrangement and hands it on to the organism above it, each returning the waste to the earth and air to recommence the work in never ending cycles. Not that this knowledge was necessary to enable the plumber to fit up a water-closet, but it gave birth to a new science whereby the plumber's art is hereafter to be directed and developed. Moses instructed the children of Israel to make the first earth-closets on record, but when they came to be gathered into cities, Moses was confronted with a series of sanitary problems that became more and more difficult of solution as the population increased. And they were precisely the same problems which bring the plumber to the front to-day. The removal of excreta and waste of cities is not left to the leisure or discretion

of anybody, but is absolutely compulsory, and proper supplies of water and air are equally so. The question which we are called upon to answer refer to methods best adapted to promote the public health on the one hand and to counteract the evil results of a false economy on the part of ignorant plumbers, shoddy-builders and mercenary owners on the other. Modern science points out in the most unequivocal terms the direct influence of evil plumbing in the propagation of diseases. Our duty and business interests both demand that we face the situation openly and boldly, neither underrating the difficulties before us nor deferring to vicious customs or traditional authority. It is no secret that one of the disabilities by which the practical sanitary artizan is often hindered, is his false relations with the architect. Relations which the sanitary experience of modern cities demonstrates should be at least modified, if not reversed. An architect is not necessarily a plumber, and is seldom, if ever, practically familiar with the laws of sanitary science, and still less with plumber's devices, methods or materials. Yet the plans and specifications of a building are prepared by an architect without consultation with the plumber, who is expected to do the work, and who alone is held responsible for its efficiency, not only by the owner, but also by the public. Let us not be misunderstood here. With the architectural beauty of a building, or of the materials of which it may be composed, the plumber has nothing to do. But it is with its water and air supplies, its sinks, closets, piping, drainage and sewerage, he should have everything. It has been customary for the architect to plan a house, arranging the sinks, closets, piping, etc., without reference to its sanitary correctness, economy or expediency. The specifications for plumbers' materials refer for the most part to their appearance rather than quality, and the expense of a device according to specifications may be made to vary 1,000 per cent. Some builders will take the whole contract to be executed under the supervision of the architect, according to plans and specifications. The builder sublets the plumbing, not to the best, but the lowest bidder, who, in order to save himself, puts his whole mind upon the arts of substitution, and how not to do things, and still keep within the specifications. The chief sufferer is the confiding owner, who, perhaps, finds his magnificent and costly dwelling little better than a "whited sepulchre," and he spends the rest of his life in repairs and alterations and is fortunate, indeed, if he is able to save his family from malaria and his fortune from the doctors. This is not a fancy sketch. It is history enacted in large cities every day. It is demonstrable that twenty per cent of the buildings in cities are replumbed annually, and the reasons, which are humiliating to the plumber and by no means creditable to sanitary savants, are that the plumber has too long permitted himself to occupy the position of the humble mechanic, asking leave to carry out the designs of his superiors as cheaply and as showily as possible, and is expected submissively to grin and bear the popular abuse heaped upon himself and his art by those who feel outraged by somebody and make the plumber a scapegoat. Now it is absurd to suppose that because time-honored, the situation is irremediable.

There is no conflict of interest whatever, between the architect and plumber, but they both need to be educated to a realizing sense of the situation. The plumber of the future will be required to conjoin his art to science, and elevate them both to the dignity of a profession, which will command the respect of the architect. The result will be that the architect will gladly avail himself of the advantages offered by the increased knowledge and experience of the plumber, and what is still more important, the sanitary welfare of the community will be enhanced a thousand fold by the union. But we must not deceive ourselves with the equally absurd idea that a change so radical is going to be effected without opposition. Apparently it is too subversive of the long-established relations between the intellectual designers of palaces and heretofore dirty plumbers, who have been trained to perform the double duty of drudge and scapegoat. And we do not expect the enmity of cheap people whose evil methods we hope to reform, will be conciliated at once, or easily, since we remember that Galileo was imprisoned for suggesting that the earth moved, and that a belief in the circulation of blood was once declared to be illegal and heretical. Innovations upon any established customs are always opposed by those whose trade or occupation is hindered by the improvement. This is also history. But the difficulties before us should only stimulate more determined effort and encourage us to the inauguration of a more harmonious co-operation between architects and plumbers. By this means public interest in the progress of sanitary science will be inspired, and, the confidence of the people gained, it will be easy to secure a wise system of legislation in order to perpetuate and multiply the sanitary advantages we shall have inaugurated. Fortunately, if we may use such a word, in a case where the accumulated misfortunes arising from the evil sanitation of cities, have been our school-masters, we are in some degree prepared for improvement, for nothing is more certain than the facts we have mentioned concerning the origin of sanitary science. Not only the public generally, but architects, doctors and plumbers, have acquired, through misfortune, the rudiments of a sanitary education whereby our contemplated revolution will be rendered easier. Owners of fine buildings, who have suffered in health, temper and pocket from bad plumbing, will be ready converts to an improved system. Architects and the better class of builders will hail the advent of a new order of things, whereby the excellence of their work will be appreciated and their profits rather increased than otherwise, while pretended plumbers, cheap builders and pseudo-architects will be compelled by law and improved popular sentiment to mend their ways, wheel into line and join the sanitary procession. It is not necessary to point out the numerous and radical defects in present systems, or the causes by which they have been engendered and perpetuated; you are all familiar with them, and also with the principles of correct sanitation, by the thorough establishment of which the evils in question may be abolished, and by no other means. We may differ, perhaps, concerning the methods of accomplishing all we want. The character of the proposed legislation and the extent to which it should enforce correct building, and especially sanitary

education, may, and properly should, be the subjects of serious and open discussion. It is also most probable that the real or fancied interests of the trade will interpose vexatious obstacles in the way of any change. But neither architects, doctors, plumbers, or the thinking public, disagree as to the existence of great sanitary abuses that cry aloud for reformation, and none dispute the fact that the proper education of all concerned is the rational course to be pursued. Educate the plumber by force of law, if it cannot be accomplished otherwise, so as to enable him to execute a wise system of sanitary art, and the plumbing of buildings will not be planned without his counsel. Evil devices, inferior materials, cheap substitutes, and unscientific plans for drainage, sewerage and ventilation, and water-supplies will be banished, because, under a correct system, involving rigid responsibility, neither architect, builder nor plumber can afford to make mistakes. In that day the master plumber will have become the sanitary engineer, and an able arbiter of matters in his department, both public and private. Not only the quality of material and the innumerable plumber's specialties by which the country is flooded, which as frequently prove to be curses or blessings, will be subjected to his judgment. Also, all questions of municipal sanitation will be submitted to his superior skill and experience. But, in order to achieve all this, we must work with an eye single to the elevation of our art, for the public welfare, and we can only accomplish it with the active and harmonious co-operation of architects and medical experts to whom are assigned the sanitary supervision of communities.

One more point it is well to suggest. As the plumber's work is subject to especial criticism on all hands, therefore justice and common sense under the coming dispensation will demand that no board of health, either national, state or municipal, will be complete without at least one master plumber.

We have everything to hope and nothing to fear; if we are sincere in our intention and earnest in our efforts we shall succeed. Let us secure an efficient system of legislation and the foundation will be laid for our sanitary superstructure. The architects will give us the plans; we will see to it that proper drainage shall carry away all noxious elements and our friends, the doctors, may stand by and approve.

The new trinity of A's, P's and D's will inaugurate a modern religion of cleanliness and health, according to the gospel of sanitary science. Its family altars shall be in every dwelling, and over the sacred threshold of the temples the demons of malaria and pestilence shall forever be banished. Let us work earnestly and honestly and as sanitary science once existed, it will be revived again more perfect than ever, and history will repeat itself as it always does.

For we are the same that our fathers have been,
We see the same sights that our fathers have seen,
We drink the same streams and we see the same sun,
And we run the same course that our fathers have run.

*Practical Gas Fitting.**

By Henry Vardiman.

SOME people prefer drop fixtures for toilet lights in the place of wall brackets. Drops for toilet fixtures should be about 15 inches from the wall. There are bracket toilet gas-oilers made for which the opening must be placed in the side wall instead of the ceiling. Both are open to objection, however, as they are in the way of moving the dresser in or out of place.

Never run a newel post supply until the stairs are finished, as the post may not come just where it is shown on the plan. Never get out pipe for one floor by the plan or diagram of another, no matter if the arrangement of the rooms is supposed to be the same.

In putting in gas pipe, care should always be observed to have no traps in the pipe, and to have the pipe drip either to the fixtures or source of supply, whether it be meter or gasometer. When it is possible to drip the pipe to the supply, be careful not to take branches out of the trunk line on the bottom, as condensation would fall into them instead of going back to the riser. This fact accounts for certain fixtures in many jobs always giving trouble while the others behave nicely.

In order to give the pipe a continuous fall in all cases, either to the fixture or source of supply, it is sometimes necessary to cut the joists through which the pipe is laid deeper than the external diameter of the pipe. So it is best to route the pipe as close to partitions or walls as possible in order to prevent weakening the joists. There is not so much necessity for giving the pipe a fall when coal or water-gas is to be used as there is for vapor-gas work. Where gas is manufactured in large quantities the makers are prepared to take out the tar and heavy hydrocarbons that are likely to condense, and the gas travels through long lines of pipe before reaching the consumer, giving the cool earth through which the pipes pass a chance to further extract any condensable constituents, so that by the time the gas enters the individual pipe system of the house it is practically a fixed gas. The gasoline gas made in the usual way is merely the atoms of atmospheric air varnished over with a good grade of gasoline, with which it will part under variable temperatures; hence the great care necessary in putting in the pipes for it, in order to avoid trouble from condensation.

Whatever kind of gas the piping may be installed for, except natural gas, it is advisable to run as much of it as possible on the interior walls and keep the underfloor pipes as remote from the exposed walls as circumstances will permit. The interior walls and central portions of the floors are of the most equable temperature, and less likely to cause trouble by condensation of the gas.

Natural gas, as a rule, is almost free from moisture and

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will not condense. Therefore, when no artificial gas is likely to be mixed with it to tide over the cold weather period, it can be piped in shallow trenches, run up the walls on the outside or placed where exposed to the action of the winter temperatures with impunity. Many natural gas wells furnish gas that is odorless. On account of the high pressure at which natural gas is delivered, together with its being odorless, it is necessary to be very careful in laying in the pipes to convey it.

In factories or stores, where the buildings get cool over Sunday in winter weather, having the piping done in such a way that there are but short branches from the trunk lines to the burners is a good feature, as it tends to prevent condensation, especially if the gas is other than well "fixed." Buildings using poor gas, and subject to variable temperatures, should have the piping arranged so as to be able to circulate the gas by burning a jet under the pipe in the basement. This not only prevents freezing and annoyance from condensation, but also improves the light if the gas is burned while warm.

Gas companies will object to a jet being placed under the pipe outside the meter connection for any purpose, as the hot gas would dry out the diaphragms of the meter if any should be burned while the pipe was so warmed. It is obvious that no circulating arrangement can be used unless it be entirely on the house side of the meter, as otherwise the gas would not be measured.

In factories and printing offices the trunk lines should be made as large again as is absolutely necessary, in order to be able to add additional lights after they are in operation; because, invariably, a greater number of lights are needed than is at first estimated. In all large buildings it is advisable to have a stopcock on the riser or main to each floor; then if anything happens, such as a fixture getting broken off, or there is some alteration or extension of the pipe necessary, one floor can be shut off without affecting the light on the others.

As a rule, the following sizes and lengths of pipe are acceptable in practice to gas companies for lighting with coal or water-gas:

Nominal size of pipes.	Feet allowed	Number burners.	Nominal size of pipes.	Feet allowed	Number burners.
¼-inch	6	1	1-inch	70	35
⅜ "	20	6	1¼ "	100	60
½ "	30	12	1½ "	150	100
¾ "	50	20	2 "	200	200

For vapor-gas, increase the sizes given for coal and water-gas at least 25 per cent., because vapor-gas is of greater specific gravity than the others, and a smaller amount of it will issue through a certain size orifice under a certain pressure in a given time. Vapor-gas condenses, too, and deposits a gummy substance which clogs the pipes more or less. No set of rules for proportioning the lengths and sizes of gas pipe will answer in all cases. The fitter must use his good judgment about the matter. For instance, suppose we fit a building with gas that gives the opportunity to use the maximum length of pipe allowed of each size, say 200 feet to the first branch, and there take off for 50 lights (1.25 inches, then continue for 150 feet with 1.5 inches and again take off for 50 lights. At that point three-fourths of the area of the 2-inch pipes would be required for the two branches; the maximum length of 1.5 inches would already have been installed, and yet there would be 100 lights to supply through a trunk line of 276 feet, without considering the extremes to which the matter might be carried by diminishing the branches accordingly. Taking the rules literally, all this would be proper and the company could not claim that the rules had not been observed, although we know the lighting of a building under such conditions would be more or less of a failure.

In fitting pipe for coal and water-gas it is always understood that bracket pipes are made of ¼-inch pipe. For that reason it is unnecessary to designate the size of them upon working diagrams. For vapor-gas, never make a bracket pipe of less than ⅜-inch, unless on the lower floor of a building several stories in height, and never, on any occasion put ¼-inch pipe under floors.

Coal-gas and other gases of less specific gravity than atmospheric air, but of about the same gravity as coal-gas, increase about 0.1 inch water pressure for every 10 feet the pipe is extended vertically. Consequently, everything considered, there is always the best pressure on the top floor. In vapor pipe work the bracket pipes should always be run downward from the upper floors, instead of upward from the lower floor, as is usually done on coal-gas work. In that way, the gravity of the gas in the bracket pipes is made to maintain the pressure, and the extra head of pressure otherwise necessary to overcome the friction encountered in the bracket pipes is unnecessary.

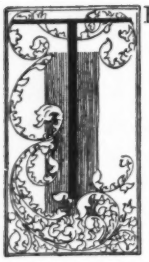
In towns that have greatly varying street levels there are often two systems of street mains, one for the high level and the other for the low district. By means of governors and feeder mains such towns have about equal pressure at all points. It is well to ascertain what provision is made by the gas company for varying pressure before making compensation for high levels in piping the house. If the building to be fitted is very high as compared with the altitude of the gasometer supplying the gas, and the building is one in which the care of a governor would not be desirable, the excessive pressure may be counteracted by running a smaller pipe than usual. An experienced man should determine the sizes to be used in such cases, however. On the other hand, if the building is low as compared with the source of supply, the pipes should be full size, even larger than is called for.

In changing from the use of coal or water-gas to vapor-gas, it is well to run a feeder riser up as high as the attic and return, connecting with the old system at two or three points. The gas will in this way spread through the pipes and give a good supply with only the head of pressure due to the gravity of the gas, while the old riser introduced the gas, perhaps double the pressure would be necessary to overcome the friction in the small pipe. When a main is connected in this way, let the old riser serve as a drip to the system.

In factories or business buildings, where a great number of lights are used, it is best to place a governor on the main branch for each floor. Then, regardless of what the pressure would be without the governors, the gas can be burned at all points at about 0.5-inch water pressure, which is the most economical pressure it can be consumed under. In store buildings or factories where nearly all the lights are in rows, it pays to locate the trunk lines near the lines of lights, as it saves running over to the center from the side, or to side from center, as the case may be.

Contract Plumbing Work.

By James C. Conroy.



HE plumbing of any dwelling house or business block is considered by all persons, no matter of what trade or profession, to be the most important branch in the construction of the building. Aside from the trouble which is likely to be caused by leakage, its relations to health are of vital importance. To be considered properly done it should have the water pipes carried through the house and made of the very best material, put up in the most substantial manner, and guaranteed to stand the wear and tear of at least five years' service without expense to the owner. The soil and drainage pipes should also be put up and ventilated under the best approved modern system.

Now, eight out of every ten who contemplate building (this has been true for the last fifteen years at least), will tell you that whoever does the plumbing in new buildings must have it done right anyway, but the lowest figures will secure the job. Now in what way do they propose to have it done right? Let us see. Very differently from the methods of thirty or forty years ago. They will go to a would-be architect or contracting carpenter and place the whole matter of their building in his hands. Rarely, if perhaps ever, have they previously seen or heard of the master plumber who is to do the work—the man who is to bestow upon them, in the shape of a home, a blessing or a curse. While I concede there are architects who are thoroughly informed theoretically on plumbing, I feel safe in assuming that two-thirds of them are not, and none of them practically; as for carpenters, I do not believe that any of them could pass an examination as sanitary experts.

But to proceed. The plan of the building is drawn up and the plumbing fixtures are placed where desired, and the specifications, after mentioning some of the fixtures to be furnished, though rarely giving definite names of the makers, as a general thing continue and conclude in this style: "This house is to be plumbed for hot and cold water, and properly ventilated. All fixtures must be trapped after the most improved manner. All joints must must be wiped joints; stops must be put in where required; all material used must be first class of its kind. This specification is intended to cover all the requirements necessary for the completion of a good job; the entire work must be done in a manner satisfactory to the architect and owner, and the right to reject any or all bids reserved," etc.

The above is a fair sample of many of the plumbing specifications presented by builders and some of the architects of the present day. It is unnecessary to say to practical plumbers that if the intention of the specifications is to secure first-class work, they are entirely deficient; hence, the owner must rely solely upon the honor of the plumber who does the work. Unfortunately, however, the plumbing is very often of a cheap class, owing to the competition enforced by this system, and as a consequence the good name of the craft is made the subject of much abuse, through the ignorance of owners in not personally selecting an experienced plumber, who would be competent to confer with them about their plumbing. Years ago, when a man wanted to put into his house or block hot or cold water, bath-tubs, water-closets, sinks, wash-tubs and other plumbing fixtures, he inquired who was an honest and competent plumber to do such work. After receiving satisfactory recommendations sufficient to gain his confidence, he would call on the plumber, tell him his needs and intentions, and order him to do his plumbing in a thorough and workmanlike manner; and in no case have I ever seen a building plumbed under the direction of an honorable and practical sanitary plumber in which the work will not outlive much of the so-called plumbing of the present day, ten to one.

When property-owners are educated to the fact that the best manner to secure the finest plumbing work, both in the materials used, the style and name of fixtures best suited (particularly in these times when the market is filled with spurious articles claiming merit, where there is none), and the proper distribution of water-pipes, proper location of stop-cocks, thorough back-air and sewerage ventilation, etc., is to entrust it to an honest plumber, one in whom he can place confidence and whom he will allow to carry out the work on a practical sanitary system, and who will guarantee the job for at least five years, as any good plumber will do. Then, and not till then, will the public realize the genuine blessings which are derived from good plumbing.

To speak more to the point of plumbing contract work, I am of the opinion that contract work will always exist, as it is governed by a natural desire to know exactly what the cost of a contemplated enterprise will be. But the contract system of doing work, like many other systems, may be abused by a lack of recognized and established rules to govern the letting out of the work on the part of the owner, and by a too greedy desire on the part of the competitors to secure all the jobs. Perhaps the most prominent error in letting out plumbing work by contract at the present time is in the fact, heretofore mentioned, that the owner lets his whole job to the contracting carpenter. As a general rule the plumbing specifications are very loose, and cannot be followed to the letter; the master plumber is powerless to do justice to the job, the owner, and his conscience, which tell him from practical experience that the specifications do not call for the standard makes of material, proper sizes or weights of pipes, proper traps and ventilation, and many other omissions necessary to the completion of a first-class job of plumbing. He is powerless to suggest improvements or alterations in the specifications to the carpenter, because he (the carpenter) cannot pay any more for the work, as he will invariably say that he has taken the job low, and could not appropriate any more money for that part of the work, and the plumber must not make the suggestions to the owner, as he (the owner) wants the best of everything at the same cost, and at once would become suspicious that it was not

right, and this course would produce a feeling between the carpenter and the plumber; consequently, the plumber is too often the silent executor of defective specifications.

In cities where there is an established sanitary code, supplemented by plumbing rules and regulations, and enforced by an inspector, all under the authority of the city, it seems impossible that under such restrictions there should occur any poor work. It will, however, be very slight compared with a city like our own, where thousands of human beings are living, and which, though one of the cleanest cities of the world, is dependent upon the honesty of plumbers of the craft for the perfect execution of their work. But where the public health is at stake, I do not consider it is safe to depend wholly on honor, therefore I would recommend moral force. Petition your superintendent to present for you to the board of health a proper set of plumbing rules and regulations to supplement the sanitary code, and, if possible, secure an inspector of plumbing to see that the laws, etc., adopted are executed, as in other cities, and by doing this you will have secured more effectual means for the benefit of the public health than you could in any other way; you will assist the purification of houses, and thereby strike a more effectual death blow to the present system of contract work than by any other means.

I would recommend that the following system of estimating on contract work be adopted by the association, to be used where their influence can prevail:

First.—That they (the association) draw up a set of specifications which will meet, to the best of their opinion, the requirements of first-class plumbing, said specifications to be applicable to a series of different priced houses, ranging from the cheapest to the best, comprising any and all fixtures necessary in the erection of dwelling houses and business blocks, and also seeing that the articles are the best and most reliable in the market at the present time.

Second.—That all members should impress upon their customers as much as possible the importance of dealing directly with their plumber, and not have him an automatic go-between with the customer and the contractor; or, in other words, that he should advise with his plumber about the matters pertaining to his plumbing, and thereby place the responsibility of his work upon him (the plumber).

Third.—It should be known who and how many are going to figure upon the work, and whether there is any preference to be given, and how much.

Fourth.—There should not be over three or four master plumbers, at the most, invited to figure upon a job; if more members, refuse to figure.

Fifth.—The figures should be given with the understanding that the result of each one's figuring be made known, and, if possible, at a certain hour and day.

Sixth.—Members should refuse to figure on work where non-members are figuring, as a man who is not filled with spirit enough to support and elevate his calling by all honorable means in his power is unworthy of recognition to that extent.

Seventh.—Members should adopt a certain reasonable percentage to be added to their net figures, as a profit, thereby preparing themselves better to protect and execute the work. They will get just as much work then as they do now, as their figures would vary, and the plumber awarded the contract would not be doing the work without a profit then, as at present.

JAMES C. CONROY.

Drainage for Health.

By Prof. R. C. Kedzie.

GENERAL drainage has been undertaken, in country districts, almost solely for agricultural purposes; but the influence of ground water on health is equal in importance to its influence on crops. The annual rainfall of the Middle States is really enormous, and this must be disposed of in three ways: (1) Used up by growing plants and evaporated by the leaves and stems; (2) flowing away either over the surface, or by subterranean channels; (3) evaporated. Figures show that the annual rainfall at the Michigan Agricultural college, at Lansing, is 32.13 inches, which, in weight, means 3,600 tons on each acre. In the absence of drainage this mass of water can be disposed of only by an increase of the natural evaporation. But evaporation is a powerful cooling process. If the attempt were made to compensate for this loss of heat by unnecessary evaporation, and to restore the normal temperature of such a soil it would require all the heat caused by burning sixty-five tons of coal for each acre.

But the evaporation of so much water producing cold renders the air over such a soil damp and chilly. This result is a physical necessity. This damp and chilly atmosphere has a more serious influence than the simple feeling of discomfort. It has a most depressing influence on the human system, lowering its tone, enfeebling the vital powers, and acting as the predisposing cause of a long list of diseases, some of them the most destructive and incurable known to medicine. The depressing influence of the dampness and chilliness of water-soaked soil is not to be compared to the effect of an occasional wetting, as when we are caught in a shower. The chilly dampness of the undrained soil is persistent and unremitting, dragging us down with its cold fingers at all hours, at "noon of day and noon of night," as if we labored and rested, waked and slept in a perpetual drizzle of a cold rain. It may seem a small force at first, but its persistent, untiring and relentless pull tells upon the strongest at last, like the invisible fingers of gravity, which finally drags down all to a common level, whether towering oak or cloud-piercing mountain. This depressing influence is not developed suddenly and distinctly; an hour, a day, a month may show no marked deterioration, else men would flee from such places as from a plague spot; but silently and secretly the sapping and mining go on till the explosion comes in sickness, suffering, and the sleep that is eternal. Once more, a water-soaked soil is the fruitful source

of malaria, giving rise to that devil, ague, and "his name is legion."

There are certain other conditions secured by drainage of the soil which are essential to the health of the inhabitants, and one of these is aeration of the soil, or the passage of air through the pores of the soil. The air is entirely excluded from water-soaked soil; the entrance of air is prevented and all interchange between the air and soil—all soil-breath—is prevented. Have you ever thought how everything breathes—animate and inanimate alike? You inspire and expire air continuously, and thus keep yourself in good condition, and so does your coat and jacket! The air penetrates every fibre of your wardrobe, passing in and out, and carrying out something it did not carry in. If your clothing was impermeable to air you could not tolerate it for an hour. The invisible waves of air wash and purify you every hour.

Let me illustrate this: I cover the bowl of a tobacco pipe with the skirt of my coat, and bringing the stem of the pipe before the candle-flame, I can easily blow air through several thicknesses of cloth and sway the flame by the current of air. I do the same thing with buckskin, a felt hat, leather and everything we wear except India-rubber.

If you suppose your clothes do not breathe, place them in an air-tight box and strangle them for a few months, when the musty smell will convince you that your clothes must breathe to remain sweet and wholesome. Even the solid bodies, such as wood and stone, are still washed and infiltrated with air.

Not only can the air pass through these bodies, but it does pass under natural conditions, and plastered walls breathe. In plastered rooms where the walls have been left undisturbed for some time, you see the position of every beam and joist, and even the lath by the lighter color of the wall. The part of the wall occupied by the plaster only is more permeable by air, which, in passing through leaves the dust behind, forming a streak.

The soil also breathes. Under proper and sanitary conditions the air passes in and out of the soil with every motion of wind. You would be surprised to see how readily air may be made to pass through soil.

But all this is changed in the presence of water in these materials. If the walls of the house are wet, the passage is prevented. A drenched soil is a drowned soil; all the conservative influences secured by the interaction of soil and air are cut short by the presence of ground water. Such a soil must be unhealthy aside from the cold and damp quality of the air which overlies it, though these are themselves prime factors of disease.

An investigation into the causes of an outbreak of diphtheria in New York in 1872, brought out the fact that many of the old water-courses and natural springs had been filled in years before, without making any provision for draining the soil, and the disease seemed to be especially prevalent along the line of these old water-courses.

In an outbreak of cholera in Dublin in 1866, Dr. Mapother says two-thirds of the deaths took place on or close to the old water-courses that had been converted into sewers or filled up with mud.

Catarrh and rheumatism are natural products of the chills and damps of an undrained soil. Diarrhœa, dysentery and malarial fevers are very common and very severe in type in districts where ground-water abounds and the water-line approaches the surface.

Finally, extensive researches in England, Germany and America have established the fact that undrained soils greatly promote consumption. This fell disease, the direct cause of one-seventh of the deaths in the world, finds its favorite haunt in the water-logged soil. This is no wild guess, thrown out to be the sensation of the hour, but it is sustained by a vast army of facts, and is a result incrops on a water-soaked soil, the abundant house crop of dependently reached by separate investigation in widely separated countries. However precarious may be the field consumptives may safely be counted upon.

The sanitary drainage of dwellings has received more attention than that of the fields, but is still too much neglected. The sentimental rather than the sanitary idea of home has captured our thought. The paradisaic poetry and fiction, which attempt to describe the ideal beauties of home, which sing of "foaming rills, of gushing fountains with many a rill, of damp moss glistening with orient pearls, of blissful bowers, of thickest covert, of inwoven shade, of umbrageous grottos and caves of cool recess," will do well enough for the unreal world of the imagination, but will scarcely answer for the hard world of actual life. Mr. Adam, with a crick in his back or his left knee doubled up with rheumatism, Mrs. Eve, with an old shawl over her head and a tear in her eye as she groans over the jumping toothache, and little Abel, as he trots around with

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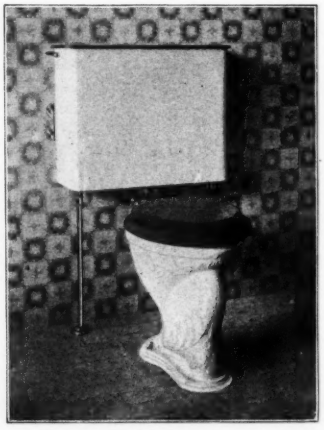

a cold in the head and a nose that calls constantly for a handkerchief, are not poetic. They are pathetic rather than poetic. Dampness and shade, gushing springs and dripping moss, delightful smothering with flowers and twining plants, will do well enough to read about before a rousing fire with your feet in warm slippers, but they have their little drawbacks in actual contact. When sentimentalists spin off this delicious alliterative nonsense in behalf of wet and wooing, flowing and flowery, give them the curt sanitary admonition with a double meaning—dry up!

That healthy houses may be built upon very unpromising sites by first securing good drainage, is a matter of daily experience. A tract of land in the suburbs of Detroit was so wet that it was supposed to be nearly on the level with the Detroit river, though it was seventy feet above the river level. During the wet seasons it served as a preserve for frogs and mosquitos, and during the dry season the baked and cracked soil seemed to be gaping and yawning with ague and chills. The soil was tenacious clay with occasional pockets of sand. It seemed an unpromising spot for human habitations. Sewers were sunk ten feet below the surface with laterals for cellars. The sewers served both as surface drains and subsoil drains. There have been no cases of ague, dysentery or fever; indeed, the locality has been rendered exceptionally healthy.

Two brothers in Vermont, of strong and vigorous stock, and giving equal promise of a long and active life, married wives corresponding in promise of future activity. They both had chosen the healthiest of all callings—farming. One of the brothers built his house in an open and sunny spot, where the soil and subsoil were dry; shade trees and embowering plants had a hard time of it, but the cellar was dry enough for a powder magazine; the house in all its parts was free from every trace of dampness and mold, there was a crisp and elastic feel in the air of the dwelling. The farmer and his family had that vigorous elasticity that reminds one of the spring and strength of steel. Health and sprightly vigor is the rule, and sickness the rare exception. The farmer and his wife, though past three score, have yet the look and vigor of middle life.

The other brother built his house in a beautiful shady nook, where the trees seemed to stretch their protecting arms in benediction over the modest home. Springs fed by the neighboring hills burst forth near his house and others by his barns; his yard was always green even in the dryest time, for the life blood of the hills seemed to burst out all about him in springs and tiny rivulets. But the ground was always wet, the cellar never dry, the walls of the room often had a clammy feel, the clothes mildewed in the closets and the bread molded in the pantry. For a time their native vigor enabled them to bear up against these depressing influences; children were born of apparent vigor and promise, but these one by one sank into the arms of the dreamless twin brother of sleep under the touch of diphtheria, croup and pneumonia. The mother went into a decline and died of consumption before her fiftieth birthday, and the father, tortured and crippled by rheumatism, childless and solitary in that beautiful home which elicits the praises of every passer by, waits and hopes for the dawning of that day which shall give him back wife and children, an unbroken family and an eternal home.

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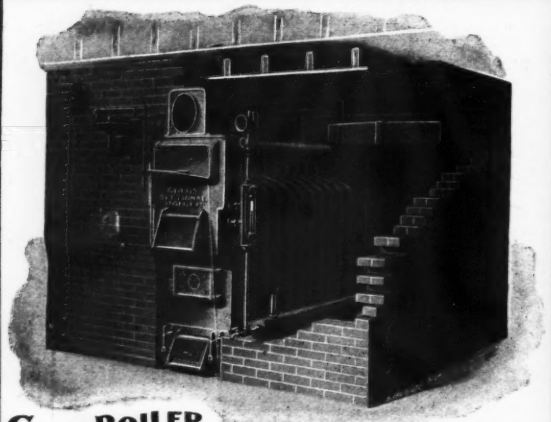

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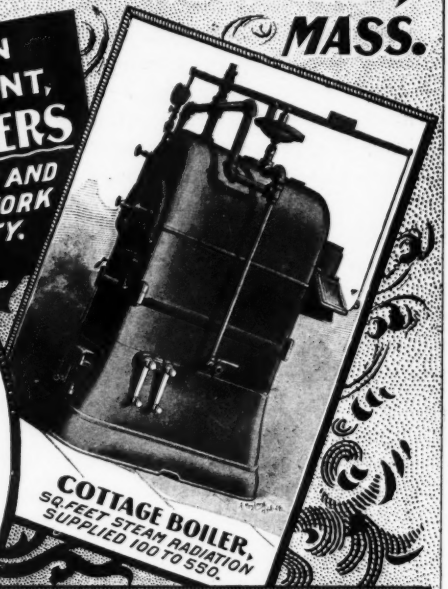

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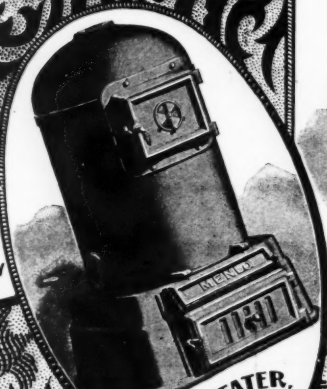

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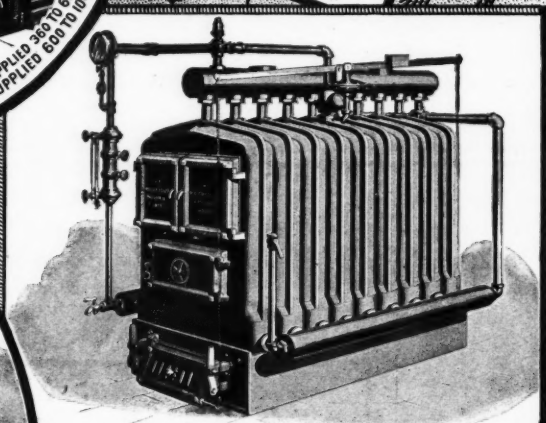

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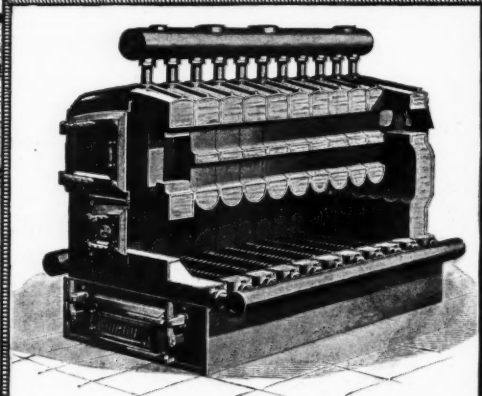

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Air Distribution.

THE location of the air inlet to a room depends upon the size of the room and the purpose for which it is used. In the case of living rooms in dwelling houses, the registers are placed either in the floor or in the wall near the floor; this brings the warm air in at the coldest part of the room and gives an opportunity for warming or drying the feet if desired. In the case of school rooms where large volumes of warm air at moderate temperatures are provided, it is best to discharge it through openings in the wall at a height of 7 or 8 feet from the floor; this gives a more even distribution as the warmer air tends to rise and hence spreads uniformly under the ceiling; it then gradually displaces other air and the room becomes filled with pure air without sensible currents or drafts. The cooler air sinks to the bottom of the room and can be taken off through ventilating registers placed near the floor. The relative positions of the inlet and outlet are often governed to some extent by the building construction, but if possible they should both be located in the same side of the room. Figs. 25, 26 and 27 show common arrangements.

The vent outlet should always if possible be placed in an inside wall else it will become chilled and the air-flow

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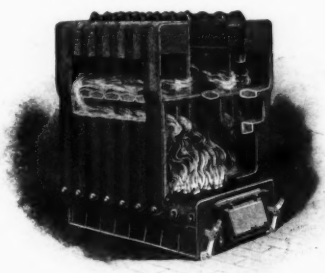

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through it will become sluggish. In theatres or halls which are closely packed, the air should enter at, or near, the floor in finely-divided streams, and the discharge ventilation should be through openings in the ceiling. The reason for this is the large amount of animal heat given off from the bodies of the audience, which causes the air to become still further heated after entering the room, and the tendency is to rise continuously from floor to ceiling. thus carrying away all impurities from respiration as fast as they are given off.

The matter of air velocities, size of flues, etc., will be taken up under the head of design.

A British Thermal Unit, or B. T. U., is the amount of heat required to raise the temperature of one pound of water one degree F. This measure of heat enters into many of the calculations involved in the solving of problems in heating and ventilation, and one should familiarize himself with the exact meaning of the term.

Heat Loss from Buildings.

The heat loss from a building is due to the following causes: First, radiation and conduction of heat through walls and windows; second, leakage of warm air around doors and windows and through the walls themselves; and third, heat required to warm the air for ventilation.

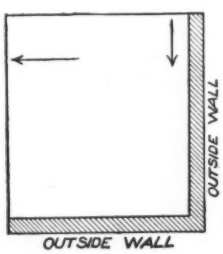

Fig. 25.

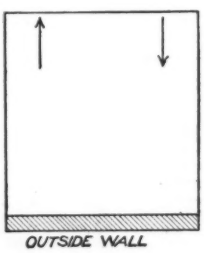

Fig. 26.

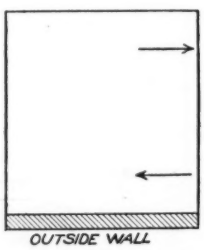

Fig. 27.

The loss of heat through the walls of a building depends upon the material used, the thickness, the number of layers and the difference between the inside and outside temperatures. The exact amount of heat lost in this way is very difficult to determine theoretically, hence we depend principally on the results of experiments.

The leakage of air from a room varies from one to two or more changes of the entire contents per hour, depending upon the construction, opening of doors, etc. It is common practice to allow for one change per hour in well-constructed buildings where two walls of the room have an outside exposure. As the amount of leakage depends upon the extent of exposed wall and window surface, it seems best to allow for this loss by increasing that due to conduction and radiation. The following table gives the heat losses through different thickness of walls, doors, windows, etc., in B. T. U., per square foot of surface per hour far varying differences in inside and outside temperatures.

Authorities differ considerably in the factors given for heat losses, and there are various methods for computing the same. The following figures and methods have been used extensively in actual practice and have been found to give good results when used with judgment

MATERIAL	Difference between inside and outside temperatures.									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
8 inch Brick Wall	5	9	13	18	22	27	31	36	40	45
12 " " "	4	7	10	13	16	20	23	26	30	33
16 " " "	3	5	8	10	13	16	19	22	24	27
20 " " "	2.8	4.5	7	9	11	14	16	18	20	23
24 " " "	2.5	4	6	8	10	12	14	16	18	20
28 " " "	2	3.5	4.5	7	9	11	13	14	16	18
32 " " "	1.5	3	5	6	8	10	11	13	15	16
Single Window	12	24	36	49	60	73	85	93	105	
Double Window	8	16	24	32	40	48	56	62	70	
Single Skylight	11	21	31	42	52	63	73	84	94	
Double Skylight	7	14	20	28	35	42	48	56	62	
1 inch Wood Door	4	8	12	16	20	24	28	32	36	40
2 " " "	3	5	8	11	14	17	20	23	25	28
Con. Floor on Brick Arch	2	4	6.5	9	11	13	15	18	20	22
Wood " " " "	1.5	3	4.5	6	7	9	10	12	13	15
Double Wood Floor	1	2	3	4	5	6	7	8	9	10
Walls of Ordinary Wooden Dwellings	3	5	8	10	13	16	19	22	24	27

For stone walls multiply the figures given for brick of the same thickness by 1.7. Where rooms have a cold attic above or cellar beneath, multiply the heat loss through walls and windows by 1.1. The figures given in Table III. are for a southern exposure; for other exposures multiply the heat loss given in Table III. by the factors given in Table IV.

EXPOSUSE.	FACTOR.
N.	1.32
E.	1.12
S.	1.0
W.	1.20
N. E.	1.22
N. W.	1.26
S. E.	1.06
S- W.	1.10
N. E. S. W. or total exposure.	1.16

In order to make the use of the table clear we will give a number of examples illustrating its use.

Assuming an inside temperature of 70 degrees, what will be the heat loss from a room having an exposed wall surface of 200 square feet and a glass surface of 50 square feet when the outside temperature is 0. The wall is of brick, 16 inches in thickness and has a southern exposure; the windows are single.

We find from Table III. that the factor for a 16-inch brick wall with a difference in temperature of 70 degrees is 19, and that for glass under the same condition is 85; therefore

Loss through walls $= 200 \times 19 = 3800$
Loss through windows $= 50 \times 85 = 4250$

Total loss per hour $= 8050$ B. T. U.

In computing the heat loss through walls, only those exposed to the outside air are taken.

A room 15 feet square and 10 feet high has two exposed walls; one toward the north and the other toward the east. There are 4 windows, each 3 feet by 6 feet in size. The two in the north wall are double, while the other two are single. The walls are of brick 20 inches in thickness; with an inside temperature of 70 degrees what will be the heat loss per hour when it is 10 below 0?

Total surface $= 15 \times 10 \times 2 = 300$
Glass surface $= 3 \times 6 \times 4 = 72$

Net wall surface $= 228$

Difference between inside and outside temperature 80 degrees.

Factor for 20-inch brick wall is 18.

Factor for single window is 93.

Factor for double window is 62.

The heat losses are as follows:

Wall, $228 \times 18 = 4104$

Single windows, $36 \times 93 = 3348$

Double windows, $36 \times 62 = 2232$

Total, 9684

As one side is toward the north and the other toward the west the actual exposure is N. W. Looking in Table IV. we find the corrected factor for this exposure to be 1.26; therefore the total heat loss is

$$9684 \times 1.26 = 12101 \text{ B. T. U.}$$

A dwelling house of wooden construction measures 160 feet around the outside; it has two stories, each 8 feet in height; the windows are single and the glass surface amounts to one-fifth of the total exposure; the attic and cellar are unwarmed. If 8000 B. T. U. are utilized from each pound of coal burned in the furnace, how many pounds will be required per hour to maintain a temperature of 70 degrees when it is 20 degrees above 0 outside?

Total exposure $= 160 \times 16 = 2560$

Glass surface $= 2560 \div 5 = 512$

Net wall $= 2048$

Temperature difference $= 70 - 20 = 50°$

Wall, $2048 \times 13 = 26624$

Glass, $512 \times 60 = 30720$

57344

As the building is exposed on all sides the factor for exposure will be the average of those for N. E. S. and W., or

$$1.32 + 1.12 + 1.0 + 1.20 \div 4 = 1.16$$

The house has a cold cellar and attic, so we must increase the heat loss 10 per cent for each or 20 per cent for both. Making these corrections we shall have

$$57344 \times 1.16 \times 1.20 = 79822 \text{ B. T. U.}$$

If one pound of coal furnishes 8000 B. T. U., then $79822 \div 8000 = 9.97$; or about 10 pounds of coal per hour will be required to warm the building to 70 degrees under the conditions stated.

For dwelling houses of usual construction the following simple method may be used. Multiply the total exposed surface by 38, which will give the heat loss in B. T. U. per hour for an inside temperature of 70 degrees in 0 weather.

This factor is obtained in the following manner. Assume the glass surface to be 1-6 of the total exposure, which is an average proportion.

Then each square foot of exposed surface consists of 1-6 glass and 5-6 wall, and the heat loss for 70 degrees difference in temperature will be as follows:

$$\text{Wall } \frac{5}{6} \times 19 = 15.8$$

$$\text{Glass } \frac{1}{6} \times 85 = \frac{14.1}{29.9}$$

Increasing this by 16 per cent for total expense and 10 per cent for loss through ceilings we have $29.9 \times 1.16 \times 1.10 = 38.1$. The loss through floors is considered as being offset by including the kitchen walls of a dwelling house, which are warmed by the range and would not otherwise be included if computing the size of a furnace or boiler for heating.

If the heat loss is required for other outside temperatures than 0, corrections must be made as follows: Multiply by 50 for 20 degrees below 0, by 44 for 10 degrees below, by 33 for 10 degrees above.

This method is convenient for approximations in the case of dwelling houses, but the more exact method should be used for other types of buildings, and in all cases for computing the heating surface for separate rooms. When calculating the heat loss from isolated rooms, the cold inside walls as well as the outside must be considered.

The loss through a wall next to a cold attic or other unwarmed space may in general be taken as about two-thirds that of an outside wall.

Heat Loss by Ventilation.

One B. T. U. will raise the temperature of 1 cubic foot of air 55 degrees at average temperatures and pressures, or will raise 55 cubic feet 1 degree, so that the heat required for the ventilation of any room may be found by the following formula:

$$\frac{\text{cu. ft. of air per hour} \times \text{number of degrees rise}}{55} = \text{B.T.U. required.}$$

To compute the heat loss for any given room which is to be ventilated, first find the loss through walls and windows, and correct for exposure, then compute the amount required for ventilation as above and take the sum of the two. An inside temperature of 70 degrees is always assumed unless otherwise stated.

Example—What quantity of heat will be required to warm 100,000 cubic feet of air to 70 degrees for ventilating purposes when the outside temperature is below 0?

$$100{,}000 \times 80 \div 55 = 145{,}454 \text{ B. T. U. Ans.}$$

How many B. T. U. will be required per hour for the ventilation of a church seating 500 people, in 0 weather? Referring to Table II. we find that the total air required per hour is $1200 \times 500 = 600{,}000$ cubic feet; therefore $600{,}000 \times 70 \div 55 = 763{,}636$. Ans.

Examples for Practice.

1. A room in a grammar school 28 feet $\times$ 32 feet and 12 feet high is to accommodate 50 pupils. The walls are of brick 16 inches in thickness and there are 6 single windows in the room, each 3 feet $\times$ 6 feet; there are warm rooms above and below; the exposure is S. E. How many B. T. U. will be required per hour for warming the room and how many for ventilation, in 0 weather?

Ans. 20,856 + for warming, 152,727 + for ventilation.

2. A stone church seating 400 people has walls 20 inches in thickness. It has a wall exposure of 5,000 square feet, a glass exposure (single window) of 600 square feet, and a roof exposure of 7,000 square feet; the roof is of 2-inch pine plank, and the factor for heat loss may be taken the same as for a 2-inch wood door. The floor is of wood on brick arches and has an area of 4,000 square feet. The building is exposed on all sides. What will be the heat required per hour for both warming and ventilation when the outside temperature is 20 degrees above 0?

Ans. 345,100 for warming; 436,363 + for ventilation.

House Heating for Comfort and Health.

A LECTURE on this subject was recently delivered before Robert Fulton branch of the National Association of Stationary Engineers at Clinton Hall, Chicago, by Prof. Philip B. Woodworth, M. E., of the Lewis Institute. The lecture, which was illustrated by lantern slides, maps and diagrams, dealt with the possibility of reproducing within doors the same climatic conditions which prevail in different parts of the globe. Following is a short outline of the main points covered:

Laboratory experiments were begun about ten years ago by the lecturer with a view to determining the relation between the amount of electricity in the air and the apparent comfort of students assembled in the class rooms. The effects were negative, the maximum variations of electric potential apparently having no effect upon the comfort or the disposition of the students. Correct records were also kept of the relation of the degree of temperature to the comfort of the students. The result was found to be that they expressed themselves as feeling well at any temperature from 0 to 95 degrees Fahrenheit. The greatest number were recorded as feeling most comfortable with the temperature at 65 degrees.

Then a series of records was kept of the relative amount of moisture in the air, with the result that the students expressed themselves as feeling exceptionally well when the amount of moisture in the air was between the limits of 35 to 75 per cent. of saturation. The amount of moisture which the air will hold at any given temperature is said to be its saturation point and is called 100 per cent. If the temperature of the air charged with moisture up to the saturation point falls ever so slightly the air will deposit moisture.

The great difficulty in house heating is that cold air containing perhaps a very small amount of moisture is taken into the house and heated to a high degree of temperature, at which it is capable of holding a large amount of moisture; whereas, by the raising of the temperature, the relative degree of humidity has been greatly lessened. Inspection of an accompanying table showed the very large quantity of moisture which it is possible for one cubic foot of air to hold between the temperatures of 70 and 85 degrees as compared with the quantities which it will hold at or near freezing point. Low percentage moisture means dry air, and dry air has a ravenous appetite for water and will take it from anything and everything with which it comes in contact. If we are looking after the comfort of individuals, they must be protected from extreme dry air.

The external effects of extremely dry air are, a leathery complexion and a generally dried up or weazened appearance of the features. The home conditions of individuals can usually be told by an inspection of their faces. To prove that this is true, all that is necessary is to inspect a map of the world or of the United States showing the distribution of moisture. People who live where the percentage is over 70 to 80 per cent. have full, clear complexions and rosy cheeks without cosmetics, while those who live in a climate having from 50 to 35 per cent. of moisture or less, will show the effect in their faces of the extreme dryness of the air.

Moreover, the water in the air acts as clothing and people who live in moist climates are protected from sudden changes of temperature. The daily variation of temperature is comparatively slight in all normal regions. In Florida where the percentage of moisture is high, the range of temperature is not over 15 degrees from day to night. In Arizona and New Mexico, where the air is very dry, the temperature ranges from 120 degrees at noon to zero at night. In the desert regions the temperature falls to the freezing point every night.

From observations on rooms full of students it was determined that where the percentage of moisture in the air is 70 or more, the students are slow, dull and inclined to be quarrelsome. The same is true in portions of the earth where the climatic conditions are similar. If the conditions of the air in the room is changed to the other extreme, say 35 per cent. of moisture or less, students generally have a headache and are very nervous and depressed. If into such a room a small quantity of moisture is introduced you can almost instantly remove the headache and the feeling of depression.

When the room is too dry the students will usually give first signs by an unconscious dry, hacking cough, which the introduction of moisture will relieve. The cause of this is that dry air coming in contact with the membranous tissue of the nose, throat and lungs causes a tickling sensation from which relief is sought by coughing.

On the other hand there is as much danger in having the room too moist as in having it too dry. Either extreme is dangerous to good health. Good authorities claim that a high percentage of moisture produces conditions such that the lungs are not required to do the usual amount of work. Such a climate predisposes toward consumption. Government reports go to indicate that the only authentic cure for consumption is produced by taking people from moist climates and placing them in a dry climate. On the other hand a dry room or office such as is nominally found in Chicago throughout the heating season is such that an excessive amount of work is required from the lungs with the result that they are made ripe for pneumania.

A chart made by Dr. Baker of the Michigan State Board of Health, covering 150,000 cases of pneumonia goes to show that during the heating season a number of cases of pneumonia vary directly with the dryness of the air in the house. A very cold snap is usually followed in ten days by an exceptionally large death rate, the excess being entirely due to pneumonia, and the victims being almost always children who are kept indoors because of the cold and their lungs weakened by the excessive dryness of the house so that when they again go to play out of doors they readily catch a cold which develops into pneumonia. People can safely be moved from a wet climate to a dry one, but as a rule it is not wise for people to move from a dry climate to a wet. Some years ago Geronimo and his band

were taken from the arid plains of Arizona to the moist low lands of Alabama with the result that the greater part of them died from consumption in the course of three or four years.

Dry air means rapid evaporation of the moisture of the lungs and rapid evaporation means colds. It is necessary for a person to feel comfortable in a dry room that the temperature must be kept from 10 to 15 degrees higher in the room than when the moisture is a normal amount, say 50 per cent of saturation. Every heating engineer knows that it probably takes 25 per cent of the fuel burned in cold weather to put on that last 15 per cent. A little moisture added to the air will save 25 per cent of the coal bill.

In the discussion which followed one of the engineers confirmed the theories of the professor by saying that in a building of which he has charge, he discovered a leaky pipe in the coil box which heats the air in the building by indirect radiation. After the leak had been stopped and the supply of steam taken from the heating flue, the occupants of the building began tocomplainof insufficient heat, in spite of the fact that the same amount of heat was apparently being supplied to the rooms and the outside temperature was not perceptibly lower.

*Utilizing Waste Heat from the Gas Engine.**

By Alton D. Adams.

EXHAUST from steam engines is now generally used for heating purposes, with good results and a great saving of otherwise wasted heat. The rapidly-increasing applications of gas engines render means for the use of their waste heat important, but little seems to have been done thus far toward effecting this end. Lack of greater progress in the utilization of the heat from gas engines is probably due in part to the forms in which this heat is available. Exhaust steam contains substantially all of the heat that can be recovered from steam engines, but at the gas engine heat appears in large amounts under two forms—the jacket water and the exhaust gases. It is a comparatively simple matter to apply exhaust steam in a heating system, but more of a problem to save the heat of the jacket water and gases for useful purposes. If buildings are to be heated by gas engines, it is quite evident at the start that heat distribution can best be effected by air, steam, or hot water in one of the usual ways. Whatever is done as to distribution of heat must not seriously interfere with the operation or efficiency of the engines, so the effects on exhaust gases and jacket water should be carefully considered. One of the first and most important points to be decided is the amount of heat per hour, or the square feet of radiating surface, or the space that may be heated from a gas engine of given capacity, when working at full load.

The efficiency of gas engines—that is, the ratio of delivered work to the fuel energy of the gas consumed—varies with their size and construction. Inspection of results from a large number of tests, however, seems to indicate that the efficiency and losses, based on the total calorific power of consumed gas, may be fairly assumed as follows for engines of moderate capacity: Efficiency, that is the ratio of delivered brake horse-power hours to the heat energy of the gas consumed, 18 per cent. Losses by conduction and radiation of heat from the engine frame, 5 per cent. Heat escaping in the exhaust gases, 37 per cent, and in the jacket water 40 per cent. As one horse-power hour of work is the equivalent of 2,545 heat units, the assumed efficiency of 18 per cent corresponds to an hourly development of $2{,}545 \div .18 = 14{,}139$ heat units at the engine for each horse-power hour of output. Of this amount of heat, 37 per cent, or 5,231 heat units, escape in the exhaust gases and 40 per cent, 5,655 heat units, in the jacket water. The sum of these losses, 10,886 heat units, represents the total heat added to the exhaust gases and jacket water, per delivered horse-power hour, but it by no means follows that all of this heat can be recovered to warm buildings. About one-half of the heat given off by the engine is in the jacket water, it seems at once desirable to add to this water as much as possible of the heat from exhaust gases, so as to combine the two supplies. Such a combination of heat seems practicable from the fact that the temperature of the jacket water is usually much below that of the exhaust gases. The requirements of lubrication hold the temperature of the cylinder, and consequently of the jacket water, at about their present maximum figures, though engine efficiency would be improved by higher values. It is, therefore, desirable to take jacket water at the temperatures now common, and add thereto as much as is practicable of the heat in the exhaust. About 150 degrees Fahrenheit seems to be the present maximum temperature advisable for jacket water on leaving the cylinder. To raise water from 32 degrees to 150 degrees Fahrenheit requires 118 heat units per pound, while 1,028 heat units must be added to each pound of water at 150 degrees, to change it to steam at atmospheric pressure. It therefore seems that only about one-tenth of the jacket water, from a gas engine, can be turned to steam by the entire heat in its exhaust gases, even if all of it can be extracted. Any plan that involved steam heat alone would consequently make use of little more than one-half of the total available heat from the engine. In ordinary cases it hardly seems desirable to make use of both steam and hot-water heating systems, so that an arrangement by which the temperature of the jacket water is raised by the exhaust gases gives the greatest promise of economy.

In a hot-water heating system, operated from a gas engine, the jacket water, after leaving the engine, should pass through pipes that are subject to the action of the exhaust gases. Leaving the gas-heated pipes, the hot-water supply should go to the radiators or other heating surface, and thence back to the water jacket on the engine cylinder. The amount of heat that can be extracted from

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the exhaust gases by the jacket water, with suitably proportioned heating surface, obviously depends to a large extent on their relative temperatures. There is much uncertainty about the temperature of gas-engine exhaust, unless all of the conditions of operation are known, but 1,050 degrees Fahrenheit seems to be a conservative estimate for an average case. Experience with economizers indicates that gases of combustion may be reduced in temperature to within 150 degrees of that of the water in the heated tubes at the outgoing end, without too much extension of the heating surfaces. Such a temperature should be selected for water that leaves the gas-heated coils for the radiating surface, that it will reach the water jacket at a certain point below 150 degrees in temperature. The temperature of water on entering the cylinder jacket should be such, at the maximum rate of flow through the system, that it will be 150 degrees on leaving the jacket. If the exhaust gases are lowered from 1,050 degrees to 350 degrees temperature they give up approximately two-thirds of their heat. As the total heat escaping in the exhaust was taken at 37 per cent of the calorific power of the gas consumed in the engine, about two-thirds of this, or 24 per cent of the heat of gas combustion, may be added to the jacket water under the conditions named. With 40 per cent of the heat from gas combustion in the jacket water before it comes under the action of the exhaust, the contained heat of the water is raised to $40 + 24 = 64$ per cent of the total amount developed. Of the heat added to the jacket water by the gas engine, the cylinder supplies $40 \div .64 = 62$ per cent and the exhaust gases 38 per cent. It will now be evident that the difference in temperature of the jacket or circulating water, from the time it reaches the cylinder until it leaves the gas-heated coils, may be varied through considerable limits, according to the design of the heating system. Thus, if the water pipes and radiating surface are so proportioned that the temperature of the circulating water falls 100 degrees, while passing through them, the temperature at the exit from the cylinder jacket being 150 degrees, the water will enter the jacket at $150 - 62 = 88$ degrees and leave the gas-heated coils at $150 + 38 = 188$ degrees, nearly. This result is due to the fact that the amount of heat required to raise one pound of water one degree in temperature at any point between the temperature limits named, corresponds very nearly to the true heat unit. If the range of temperature drop in the circulating water between the pipes to the radiating surface and those that return water to the cylinder jacket is only 40 degrees, then the rise of temperature in the water jacket, under the conditions named, is $40 \times .62 = 25$ degrees and the rise in the gas-heated coil 15 degrees. In this last case the circulating water enters the cylinder jacket at $150 - 25 = 125$ degrees and leaves the gas-heated coils at $150 + 15 = 165$ degrees. The objection to a large drop in the temperature of circulating water is the resulting low average temperature of the radiating surface and the increased amount necessary for a given work.

Allow each square foot of first-class, direct-radiating surface to dissipate two heat units per hour, for each degree difference in temperature between the water or radiating surface and the air, and a drop of forty degrees in the temperature of the circulating water in the radiator. This gives the radiator an average temperature of $(125 + 165) \div 2 = 145$ degrees, and allowing a room temperature of 70 degrees, each square foot of radiating surface dissipates $(145 - 70)\ 2 = 150$ heat units per hour. In a regular hot-water heating system, designed, as is often the case, for a drop of temperature in the radiators from 210 to 190 degrees, the average temperature of the radiator is $(210 + 190) \div 2 = 200$ degrees, and the heat from each square foot per hour is $(200 - 70) \times 2 = 260$ units. This last result is $260 \div 150 = 1.73$ times as great as that obtained per square foot for radiators supplied from the gas engine.

GEO. KESSLER, New York City.

It is evident that the average temperature of water heated from a gas engine can be raised but little above that found, if all of the heat in the jacket water is to be utilized. Thus, if the drop of temperature of the circulating water from the gas engine is reduced to 20 degrees, the rise of temperature in the water jacket is $20 \times .62 = 12.4$ degrees. The water, after entering the coils that are heated by the exhaust gases, is now raised in temperature only $20 - 12.4 = 7.6$ degrees, making its maximum temperature $150 + 7.6 = 157.6$ degrees and its average $(137.6 + 157.6) \div 2 = 147.6$ degrees, or only 2.6 degrees higher than when a drop of 40 degrees was permitted. If a larger variation of temperature in the circulating water exists, the average temperature is still lower. A result of the comparatively low temperature of water heated by gas engines is that about 1.73 times as much radiating surface must be used to dissipate heat at a given rate as is the case with the best independent hot-water systems. The cost of additional radiating surface is obviously a small matter compared with the great saving in heat to be made by the utilization of jacket water and exhaust from gas engines. As is well known, higher cylinder temperature, if satisfactory lubrication can be maintained, contributes to an increase of gas-engine efficiency. Such an increase of jacket water temperature as would permit exhaust gases to raise this water to 210 degrees would therefore add to engine economy and cut down the radiating surface necessary to utilize the waste heat of gas engines. On the assumption that 14,139 heat units are developed at the gas engine for each brake horse power delivered, it was found that about 5,655 of these heat units pass into the jacket water. Practically all of this heat is available in a hot-water heating system,

save the small amount necessary to raise the circulating water to the temperature of the building heated or to the temperature at which the water flows from the heating coils. Of the 5,231 heat units that escape in the exhaust gas, for each delivered horse-power hour, it was found that 66 per cent, or 3,452 heat units, representing 24 per cent of the total amount developed, can be added to the jacket water after it leaves the cylinder. The total heat available for general purposes from a gas engine, under the stated conditions is therefore about 5,655 + 3,452 = 9,107 heat units per delivered horse-power hour. It was shown that one square foot of good radiating surface, when supplied with hot water from a gas engine, the drop in temperature at the radiator being 40 degrees, dissipates 150 heat units per hour, in an atmosphere at 70 degrees temperature. For each horse power delivered by a gas engine, about 9,107 ÷ 150 = 60 square feet of direct radiating surface should be supplied. So many factors enter to determine the heat necessary to warm buildings that no general and exact rule can be given, but allowing 10 heat units per hour for each cubic foot of space warmed, as a

JNO. F. DEEDY, Worcester, Mass.

rough approximation, 9,107 ÷ 10 = 910 cubic feet may be heated for each horse power delivered by the engine.

The heat from gas engines may readily be applied to heating purposes in either of three ways—that is, by direct or indirect radiation and by the hot-air system. Pipes and heating surface are proportioned for either of these arrangements with heat from gas engines on the same principles as when a regular hot-water heater is used, except for the lower average temperature of heating surface and perhaps greater fall of temperature for the circulating water. Hot water from gas engines may be used for general heating, not only in private plants and buildings, but also for public supply through mains laid in the street. In this last case, or for any other where the distance or conditions prevent a suitable circulation of the water as a result of its fall in temperature, pumps may readily be used to maintain any rate of circulation desired. Power pumps driven by the gas engines will naturally be employed, and the consumption of gas required to operate them, in a well designed system, will represent only a small fraction of the heat energy recovered from the jacket water and the exhaust gases.

To consider the amount of coal that may be saved by the use of gas-engine exhaust, let the heat developed by the perfect combustion of one pound of coal be taken at 13,000 heat units. The boilers of heating systems in buildings may be expected to deliver to steam and hot water hardly more than one-half of the possible heat from coal, or 6,500 heat units per pound of coal burned. As each horse-power hour of operation by the gas engine was found to deliver 9,107 heat units to the circulating water, this amount of operation is equivalent in the heating system to 9,107 ÷ 6,500 = 1.4 pounds of coal burned under the steam or hot-water boiler. In the case of a 100 horse-power gas engine operating the equivalent of 3,000 hours at full load, or 300,000 horse-power hours, the heat imparted by it to circulating water would equal that from 300,000 × 1.4 = 420,000 pounds of coal. This coal, at $4 per short ton, has a value of $840, to say nothing of the labor necessary to operate the boiler and furnace where it is consumed. The arrangement of heating coils to receive the jacket water and add to it the heat of exhaust gases involves only a very moderate expense, and the care of this arrangement could be readily included with that of the gas engine.

So long as the gas engine cylinder is kept within the desired temperature limits, the operation of the engine is obviously not affected by any use of the jacket water, so only the reaction of the heating system on the exhaust gases need be considered. In order to force the gas engine exhaust through the bank of heating coils in which the jacket water circulates, a small back pressure must be set up in the engine cylinder. With properly designed heating coils, this back pressure should be small and thus increase the gas consumption but little. Assuming a mean effective pressure of 50 pounds per square inch on the gas engine piston, from the gas explosions, and 2 pounds per square inch back pressure, as a result of the heating coils, there would be a loss of 4 horse power on the 100-horse-power engine. In order to bring the engine up to 100 horse power, the gas consumption must be increased by the equivalent of 4 (14,139) heat units per hour, by the assumption formerly made, or 81 cubic feet of gas, with 700 heat units per cubic foot. The value of this gas at one dollar per cubic foot is 8.1 cents, but the heat delivered by the gas engine to the hot water system during one hour amounts to that from 1.4 × 100 = 140 pounds of coal under a heating boiler. At $4 per ton the value of this coal is 140 × $4 ÷ 2,000 = 28 cents, or three and one-half times that of the gas. With gas for gas engines produced on the premises the advantage in favor of the heating system would be greater. There seems little doubt that the large amount of heat now wasted by gas engines will gradually be applied to useful heating operations, as in the case of steam egines.—The Enginering Magazine.

Progress of Gasoline Lighting.

AMERICA, the mother of genius, has to its credit more useful scientific inventions in the past decade than all other countries combined. At present the sciences and arts are promulgated through the medium of more endowed institutions than in any other country under the sun. What wonder then that the rest of the world holds its breath in expectancy? The application of steam, electricity and chemistry in the production of light, heat and power and the thousand and one other comforts and conveniences that the modern world enjoys to-day. The production of an article of merit is always signalized by its rapid adoption all over the country and numberless manufactories for its production spring into existence almost simultaneously; this fact alone is enough to demonstrate that the article is a commercial success.

Witness within the short period of twenty years the success of the electric motor, its application to propulsion of street cars, vehicles, factories and the production of light and heat. We can confidently look forward to the direct production of light from coal within the near future. In the meantime, one form of light that has become a powerful competitor of electricity and gas is produced from direct combustion. The fuel so converted is one of our most common products—gasoline.

The word gasoline has ceased to be the cause of visions in which the skull and cross-bones are most conspicuous, and in place there has appeared one of the most wonderful lights of modern times, wonderful not only on account of its brilliancy but its cheapness of operation and installation together with its safety. ,

Intelligence is a characteristic of the American, and he recognizes that the gasoline light has surely come to stay. Numberless villages are now lighted entirely with gasoline lights. Stores are as brilliantly lighted at a country cross-road to-day as an apartment store is in New York or Chicago.

Three years ago the general public had never heard of an incandescent gasoline light. To-day every man, woman and child is acquainted with some form of gasoline light. Three years ago there were less than $1,000 invested in incandescent gasoline lights, since then $25,000,000 has been invested in them. Seventy factories employing from twenty to four hundred men each are now running overtime trying to keep up with the demand. Village and town lighting with gasoline has become as popular as electricity for the same purpose, and gas has become a very small factor, indeed, and becomes less popular as the efficiency of gasoline becomes apparent. Gas for lighting and especially for street lighting, is rapidly becoming relegated to the background, leaving electricity and gasoline to fight it out between them.

R. L. Doran.

Acetylene Lighting for Houses.

Acetylene, and calcium carbide, from which it is obtained, have been before the public as commercial possibilities for about five or six years. During this time it has had to meet the opposition of conservatism and conflicting interests, as is ever the case with innovations. From a careful examination of the conditions, it would seem that the very simplicity of the method of generating the gas, which, at first sight, is its greatest recommendation, has been, in a large degree, the means of retarding its wider introduction.

To the unscientific person of inventive inclinations, the aceytlene gas generator has been an inviting field of operation. The result has been that many crude devices have been offered for sale and frequently advertised with greater skill than was manifest in the construction of the apparatus itself. In their eagerness these makers have invariably asserted the perfection of their machines, and where accidents have occurred or defects have developed, it has been difficult to separate facts from the many conflicting reports. The true cause of many accidents has thus been overlooked or ascribed to carelessness of the operator, when, in fact, the difficulty was traceable to defective design or construction of apparatus.

The first requisite in designing acetylene apparatus should naturally be a thorough understanding of the principles underlying the action of water upon calcium carbide in its various commercial forms. Calcium carbide is a hard, stone-like substance, formed by the action of the intense heat of the electric arc upon a finely powdered and intimate mixture of lime and coke. The carbide is broken up in crushers, and is usually found on the market in 100-pound cans covered with wood lagging. The average size of lump carbide varies from about a 2-inch cube to pieces of two or three pounds' weight, while grades known as "¾" and "¼" inch are also to be had. The last two sizes are obtained by screening.

The carbide, when brought in contact with water, liberates acetylene gas, while ordinary lime is left as residuum. Each pound of carbide requires but about half a pint of water to complete the chemical reaction and liberate all of the gas, but as each pound of carbide, in slaking, gives off enough heat to raise one gallon of water nearly 90 degrees Fahrenheit, the residuum would be raised to a dangerously high temperature. The only safe way is to apply sufficient water to flood the residuum, the amount necessary varying in different types of generators.

This heating effect is nearly always either entirely overlooked or only partially overcome by the average generator maker. When his attention is directed to evidences of heat in the generator he invariably asks, "Well, what of it?" The answer is simple. Acetylene ignites in air at about 896 degrees Fahrenheit, and in cases where a relatively small amount of water is applied to the carbide this temperature may readily be obtained. Several cases have come under the writer's observation where the carbide receptacle presented a glowing mass when removed from the generator, and burst into flame when in contact with the air.

There is, fortunately, a simple means of determining whether a dangerous temperature has been reached, and that is by the appearance of the residuum. When properly slaked, this has the appearance of ordinary lime, and is of a pearly gray color; but if it has been overheated, traces of brown will appear, due to the presence of coal tar products caused by the overheating of the acetylene. These brown impurities appear at about 536 degrees Fahrenheit, and, aside from the danger of ignition in the generator, they reduce the candle power of the gas, clog the burners, and tend to form explosive compounds with the copper in brass fixtures. Therefore, it may be said to the prospective purchaser of acetylene apparatus, buy none in which the residuum, when removed, is brown in color.

The next property requiring careful consideration is the explosiveness of the gas. Much has been written of the dangerous character of the gas itself, even without mixture with air; but it has been pretty definitely determined that the pure gas, when properly generated, and maintained at low pressures, will not explode from shock of fire. When compressed to two atmospheres it begins to show explosive qualities when heated. When, however, air is mixed with acetylene, it becomes violently explosive, the range of explosiveness extending from about 3.1 per cent. of gas to 24 per cent., some authorities placing the upper limit as high as 82 per cent. In form of burner usually employed the openings in the lava tips are very small, and a match may be applied to such a burner, passing a mixture of gas and air, without danger of explosion; but such is not the case if the burner tip be removed from the mixture. Bearing these facts in mind, the generator must be constructed to contain a minimum of dead air space when first started. The lesson of experience has

been that the person starting the apparatus frequently becomes impatient in waiting for the small blue flames to reach their full size and brilliancy, and he removes the burner tips to accelerate matters, trying the openings with a match. This method, while invariably effective in determining whether or not the air mixture has passed off, cannot be employed with safety to the person or surrounding property. Many such instances are on record, and have, correctly enough, been set down to carelessness, but the primary cause of the difficulty is defective design of the apparatus. It is entirely possible to construct apparatus which will give almost pure gas immediately. Further than this, the portion of the machine which must be opened for recharging should not introduce a large amount of air into the system.

To these conditions and to one other practically all accidents thus far recorded may be attributed, although the causes producing these conditions were numerous. It is repeatedly stated by generator men that acetylene being of slightly less density than air, rapidly diffuses, and that it would require a large amount of escaping gas to produce explosive mixtures in a room. Cases are on record, however, where by draughts a current of escaping gas has been carried many yards, and, igniting at distant fires, has flashed back to the machine, doing much damage. Another provision thus becomes imperative. The apparatus must be provided with a safety pipe of ample size leading outdoors and extending at least 12 feet above ground. The open end of the pipe should be well protected by wire netting or other means against stoppage by wasps' or birds' nests, and should have a return bend to keep out rain water. Much depends upon the efficiency of this safety pipe.,

Still another feature is essential to the safety of the apparatus, but under pressure of competition it is frequently neglected. With a view to increasing profits, makers of machines are frequently induced to rate them above their real capacity; that is, provision is not made for the quantity of carbide necessary to supply the specified number of lights. The charge becoming exhausted, the lights go out, necessitating recharging at night. This is a dangerous operation by artificial light, and should be avoided. In purchasing a machine, the buyer should see that an allowance is made in the generator for at least eight-tenths of a pound of carbide for every half-foot burner. For a dwelling this allowance would probably suffice for the daily lighting period; but for other conditions of service, the amount should be increased accordingly.

A type of machine which has recently received considerable attention consists of a form of carbide hopper having a sloping or conical bottom, and fitted with a feeding mechanism arranged to admit carbide to a water tank below in proportion to the demand of the lights. This type is known as the "carbide feed" machine, and is intended for the use of ¼-inch or fine carbide without large lumps. This type presents the advantages of small size and compactness for large capacity, no after-generation or waste of gas when lights are extinguished, and ability to carry heavy overloads. On the other hand, the fine carbide contains slightly less gas per pound than lump carbide (about 4½ cubic feet per pound), and great care must be exercised in the construction of the feed mechanism to prevent clogging and possibility of excessive and sudden discharge of carbide into the water. Fine carbide, on striking the water, is converted into gas almost instantly, and care must be exercised to prevent development of dangerous pressures. It may be said that this type of machine presents great possibilities in the field of automatic generators.

The manufacturer having made ample provision for all these matters, it further remains for him to provide for a steady and uniform pressure in the apparatus, to provide automatic means for removing all condensation in the piping, and to pay strict attention to simplicity and substantial construction. If it may be assumed that the purchaser has obtained such a machine, it remains for him to place it in charge of a competent person who will not neglect it at the proper time for cleaning and recharging, and will under no circumstances bring an open light near it.

At present it does not appear likely that acetylene will become a serious competitor of electric light or city gas in the larger towns, but in small towns and villages where the amount of lighting done will not warrant the expenditure called for by electric or city gas plants, acetylene is eminently well adapted. For isolated buildings of various kinds it is an ideal illuminant. If the user of an acetylene gas machine will but bear in mind the fact that he is operating his own gas works and will act accordingly, there is no reason why acetylene should not prove a reliable and satisfactory form of illuminant.

Little has been said in the above regarding the use of acetylene under high pressure. While this subject has been experimented upon to some extent, it has not yet been sufficiently investigated to make known, and enable provision for, the exact conditions necessary to prevent explosion. As it is, many serious accidents have occurred from the use of the gas under such pressure.—Theodore Varney in Cassier's Magazine.

The Buffalo Aceteylene Convention.

No one who is interested in the subject of acetylene gas lighting can afford to miss the convention of the International Acetylene Association to be held at Buffalo, beginning June 20th.

The program committee, which met recently in Chicago, decided upon a program, and men prominent in their respective lines will be asked to contribute papers on the following subjects:

Placing the acetylene generator on a firm commercial basis.

Insurance with special reference to lamps and small apparatus.

Application of acetylene to heating.

The birth of acetylene.

The future of acetylene.

Carbide, its price, quality and condition of sale.

Car lighting with acetylene on the low pressure system.

Car lighting with acetylene on the high pressure system.

Application of acetylene to locomotive head lights.

Application of acetylene to projection work.

Relative merits of acetylene and gasoline lighting.

Acetylene town lighting as viewed from the eastern standpoint.

Acetylene town lighting as viewed from the western standpoint.

From all indications the convention promises to be an unparaleled success from every point of view. The officials of the Pan-American Exposition have prepared a handsome building which is being used exclusively for the display of acetylene apparatus, and this feature alone will boom the industry as it has never before been boomed, for thousands of people will there see for the first time the simplicity and beauty of this style of lighting.

Program of Acetylene Convention.

The International Acetyline Association, which convenes at Buffalo June 20, 21 and 22, will listen to the following papers, which have been arranged for by the program committee:

"Purification of Acetylene," G. W. Kuchler, with the Roessler & Hasslacher Chemical Co., New York City, N. Y.

"Acetylene Heaters and Cookers, and Their Application," A. T. Murdock, Secy. American Acetylene Stove Co., Minneapolis. Minn.

"Town Lighting," Emory S. Turner, No. 45 Broadway, New York.

"The Future of Acetylene Gas," Geo. Landis Wilson, F. Cortez Wilson & Co., Chicago.

"Relative Merits of Acetylene and Gas Lighting," Wm. Finkler, W. Finkler & Co., Chicago.

"Results of Practical Experiments with High Pressure Lighting," Harvey T. Hauer, with Lebanon Fuel Illuminating & Power Co., Lebanon, Pa.

"Acetylene as Applied to Locomotive Headlights," Mc. Donald Elliott, Santa Rosa, Calif.

To Protect Acetylene Industry.

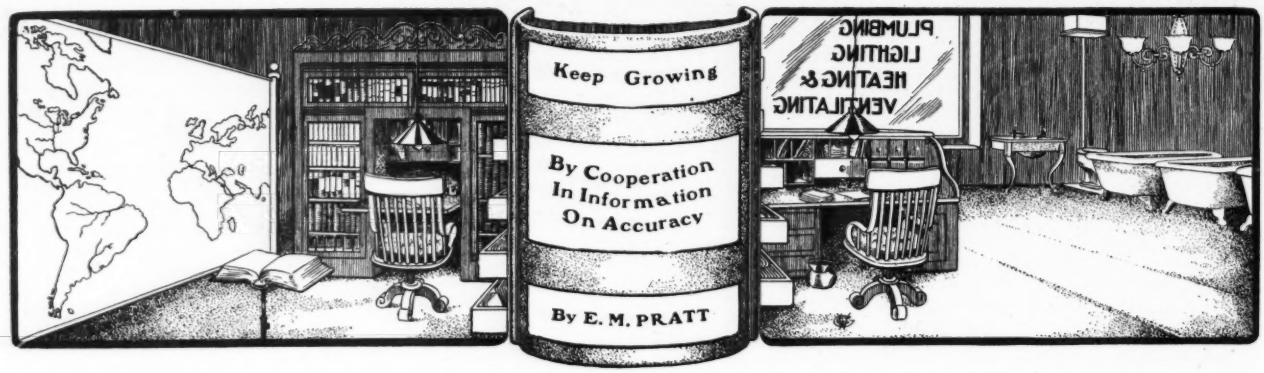
There has been a convention of Swiss, Austrian, Swedish, Norwegian and German manufacturers of calcium carbide, and they have combined in establishing price-scales and a mode of controlling the sale of their products. It is expected that by this convention the acetylene industry will be considerably strengthened. The members have adopted measures to avoid the fluctuating and ruinously low rates which, owing to heretofore sharp competition, have made the manufacture of their products unprofitable. Thirty-two of the smaller towns in Germany are now lighted by acetylene gas, and a number of other plants are in the course of erection. The gas is also extensively used by railroads for lighting passenger cars. The year's production of calcium carbide is estimated at 120,000 metric tons, equivalent to 9,500,000 gallons of petroleum.

The Light of the West.

The Omaha Mantle Company, of 1319 Douglas street, Omaha, Neb., are quoting a very low price this month on their "Diamond" line of incandescent mantles, a line which combines the features of low price and high grade. The Omaha Mantle Company has for its chemist a man who has had twenty-one years' of actual experience in his particular line of work, having learned the mantle making process in Buda Pesth, Hungary, where the mantle business originated. After many years of experimenting he has evolved a wonderful improvement in the chemical process, and the "Diamond" mantle is the result, giving a pure white incandescence of great power and great durability with small consumption of gas. They are equally adapted for either coal gas or gasoline, giving splendid results with both. The company also makes a special mantle for gasoline high pressure arc lamps.

Acetylene Gas Burners.

The State Line Talc Co., of Chattanooga, Tenn., send us a handsome little catalogue of the D. M. Stewart acetylene burners, showing a most complete line of burners for every purpose. They will be pleased to send a copy of this catalogue upon request to any one using or dealing in acetylene apparatus.



Let the big book of drawers full of envelopes represent the medium between you and me. Imagine that the drawers slide both ways and that the envelopes are alphabetically indexed on both sides. My work is to go into all the world to collect better personal, professional and commercial methods useful to you in your work during the day, the week, the year, the century. This page is for the exchange of questions, answers and experiences.

HOW can one keep growing? How have you gained in daily useful information? A few years ago a boy was carrying water for a gang of men in a Chicago mill. The boy carried a little blank book in his pocket and a pair of open eyes in his head. He asked questions and used a pencil as well as his memory. To-day he is manager of a prominent department in a large corporation.

Last month a man who has been a successful printer for twenty-five years told me that within a few years he had become quite proficient in the Spanish language during spare time study. He says he wants to let the younger men in his firm shoulder more of the work and thus secure more time for his mental pleasures while he is trying to grow old gracefully or rather keeping ever young.

Can you command your memory to do something for you at a certain time in the future? Can you say to yourself that you want to do so and so at a certain hour and then forget all about it and have it pop up in your mind at the right time? When a little more than a dozen years old a playmate used to call for me very early in the morning and both of us would get on his father's horse to go several miles to pick strawberries for two cents a quart, but we found that it was taking too much time for him to call for me, so I was to meet him at a cross-road at 3:30 a. m. In order to do this I had to get up at 3 o'clock, and in order to get up at 3 o'clock on retiring the evening before I would say to myself I must get up at 3 o'clock. I can remember being surprised over getting out of bed exactly on time several mornings. Any experience you may have had regarding controlling your memory I shall be pleased to receive for my collection of unpublished information.

If you see a man talking with another man and you wish to see him when he is at liberty, have you a sign to give him without approaching him so that as you stand around at a distance he will know that you are waiting for him, or that you want to see him before he leaves?

Biographical study teaches us that friends of a man who is having a long climb for his goal generally get tired of his subject and his hopefulness just before his victory. This is unfortunate in many ways, but it is human nature. Many a man can afford to go through the fire in order to learn who are his enduring helpers. Enthusiasts do not fall down so often from lack of correct reasoning as from lack of physical endurance.

BEATEN by carpets is the subject of a little experience recently. Some time ago an old friend of mine told me that he would give a hundred dollars to know what to do with beggars and how to distinguish between worthy and unworthy cases. Calling upon him a few days ago I asked him to start the ball rolling by ordering a report on the subject and thus helping me get started and interest others to the extent of making a thorough collection of experiences and methods. He told me he could not do it and he told me why. He had been away from his business for several months at an extra expense of several hundred dollars and that he had moved this spring, which had caused him to discover that their carpets were worn out and new ones must be secured. He told me to drop in a month later and he might be better natured. This event made me think of an occasion in Cleveland where I called on a young man determined to sell him a copy of a small book. I had made a splendid plea and felt safe, but was unable to talk back when the young man told me he had been out of work for some time, used up all his money, had been in that place but a few days and had not had a pay day. Sometimes some things are more for exercise than for products and though we may feel uncomfortable at the time later on they become a source of pleasure as we look back on them.

Thoughtless greetings deserve cool receptions. This morning, I met three men talking politics. They were in hot water over some complication and as I came up with a breezy good-morning salute, they continued their politics without noticing me. A dozen minutes later on the train one of the men answered my enthusiasm in his usual hearty manner. There are times when all men are not themselves and at such times we must respect conditions.

It is easy for any one to understand what would happen if a ten-horse power boiler were required to run a dozen different things requiring a twenty-horse power boiler. The boiler would either burst or get tired. Now a man's body is his boiler and it has its limit. Its success depends a great deal what is put in the firebox and general management, but every one should remember that there really is a limit though the fuel and conduct be perfect. Just how to find this limit is something of an experiment, but it should be found if possible and a certain amount of reserve energy always left in stock.

The washer-woman's boy with a soap-box for a desk and bookcase and perseverance for a guide can give himself a $10,000 education.

E. D. HORNBROOK, KANSAS CITY, MO.

Elected a member of the Executive Committee of the National Association of Master Plumbers at New Orleans, La., in 1899. Elected Vice-President at Baltimore, Md., in 1900. Elected President at Kansas City, Mo., in 1901.

National Association of Master Plumbers

Nineteenth Annual Convention at Kansas City, Mo., June 4-6, 1901

Reprinted from our Daily Edition published at the Convention City.

IDEAL convention weather greeted the early comers to the nineteenth annual convention of Master Plumbers as they swung from their trains onto the platform of the station and faced the city which they were to look upon as home for the four days of their sojourn. At every turn they made they were welcomed with the glad hand of fellowship, and if any one in the crowd felt the slightest pang of loneliness or neglect it was not because of any lack of hospitality on the part of the townfolk or the visiting delegates, but because he himself had never learned the noble art of mixing with his fellows and being one of them. The entertainment committee were most solicitous for the welfare of the delegates and were in perpetual and helpful evidence, securing accommodations for this one, answering the questions of that, not relaxing their efforts till every delegate wore a look which said plainly, "I'm quite at home and very comfortable, thank you."

The ladies' committee, too, was charmingly manifest, and looked after the comfort and cheer of the visiting ladies with sisterly devotion. They have prepared a program for their entertainment which will make the visit to Kansas City a memorable event in the life of every visitor. The parlors of the Ladies' Entertainment Committee are on the first floor of the Baltimore Hotel, near the elevator, and it is the wish of the committee that all ladies attending the convention should register there. Following are the ladies who will act as hostesses during the convention:

Mrs. E. D. Hornbrook, Chairman.

Mrs. George P. Kirtley, Secretary.

Mrs. D. E. Allison.	Mrs. A. Gray.
Mrs. W. G. Ashdown.	Mrs. W. W. Good.
Mrs. R. J. Cathcart.	Miss L. Hanson.
Mrs. W. R. Marvin.	Miss L. Wright.
Mrs. R. T. Connell.	Mrs. F. Hacker.
Mrs. W. H. Corcoran.	Mrs. B. Evans.
Miss Louise Catter.	Mrs. C. F. Kelly.
Miss LeTitio Catter.	Mrs. J. F. Mallon.
Miss K. McDonnell.	Mrs. J. G. Mallon.
Miss E McDonnell.	Mrs. F. W. Miller.
Mrs. J. P. Cunningham.	Mrs. J. L. Ryle.
Mrs. R. L. Dawson.	Mrs. C. L. Smith.
Mrs. W. C. Dougherty.	Mrs. D. Yates.
Mrs. H. Fellerman.	Mrs. G. W. Buss.
Mrs. H. McCutcheon.	Mrs. G. Little.
Mrs. W. K. Reeves.	Mrs. W. H. Dow.
Miss Adelaide Hanson.	Mrs. J. Catter.
Mrs. T. P. Maloney.	Miss J. Catter.
Mrs. M. Haljerson.	Mrs. J. McDonnell
Mrs. J. V. Pardee.	Mrs. J. T. Curley.
Mrs. J. H. Richardson.	Mrs. A. L. Zinn.
Mrs. M. Richardson.	Mrs. M. B. Frost.
Mrs. M. W. Scannell.	Mrs. H. B. Farley.
Mrs. C. P. Schroeder.	Mrs. E. Farley.
Mrs. H. W. Sivewright.	Mrs. E. Doherty.
Mrs. E. M. Taylor.	Mrs. L. A. Farley.
Mrs. W. Warmholz.	Mrs. H. Martin.

The gentlemen who make up the entertainment committee, and to whom the thanks of all good convention goers are due for hospitalities rendered and to come are: Henry Goss, chairman; W. H. Dow, secretary; Timothy Cotter, W. L. Hanson, E. D. Hornbrook, J. H. Richardson, T. P. Maloney and J. P. Cunningham. Mr. E. G. Hornbrook will be found at all hours in the reception parlor at the entrance of the Baltimore Hotel.

The committee has had printed a handsome souvenir program of which every delegate should have a copy and keep it constantly with him for his guidance. From it we extract the following outline of events:

First Day, June 4th, 1901.
Morning, 10 o'clock.

The Nineteenth Annual Convention of the National Association of Master Plumbers will please come to order.

Afternoon.
Session of Convention.

Ladies visit Manufacturers' Exhibition in Convention Hall, assembling at Headquarters by 5 o'clock, sharp, for carriage drive about city, and to witness exhibition by the Kansas City Fire Department in Roanoke.

Evening, 9 o'clock.
Reception and Musical, Hotel Baltimore.

Second Day, June 5th.
Morning.
Convention Session.

Ladies' trolley ride to Leavenworth, Fort Leavenworth, St. Mary's and Soldiers' Home.

"If ye be willing and obedient, ye shall eat the good of the land" at "The New Planters," Leavenworth, Kansas.

Notice to Ladies:

Take Chelsea Park, or Quindaro Boulevard cars on Eighth Street not later than 8:30 in the morning. Change to Leavenworth line at Sixth and State Streets, Kansas City, Kansas.

Afternoon.
Convention Session.
Evening.

If there is no session of Convention, delegates will visit Manufacturers Exhibition —ladies remain at hotel and play solitaire. "Don't you ever think it."

Third Day, June 6th.
Morning.
Convention Session.
Freedom of Kansas City for the ladies.
Afternoon
Convention Session.

Ladies requested to assemble at Headquarters at 2 o'clock sharp, for luncheon at Emery, Bird, Thayer & Co.'s tea room.

"Whatsoever is set before you eat, asking no questions for conscience sake."

Evening.

Every one to Electric Park.

Rendezvous—Fifth Street and Grand Avenue. Before 8 o'clock.

The Day We Celebrate, June 7, 1901.
Association of Master Plumbers,
Kansas City, Mo.,
AT HOME,
Friday, June Seventh,
Nineteen Hundred and One,
Fairmount Park.
"I WAS THERE."

But let not any one think that the ladies will monopolize the good times, as a casual glance at the program might lead one to infer. There will be much merry-making which is not down on the bills. For instance the Benevolent and Protective Order of Elks have courteously thrown open their lodge rooms to all visiting members of the association and all who visit their rooms may be sure of a hearty welcome. Kansas City has a reputation for hospitality which she is bound to maintain and it is safe to say that every delegate will go from her hospitable gates with the words: "I am glad to have been there."

First Day—First Session.

TUESDAY morning found the sky beclouded and showers of rain fell at intervals till it began to look as though the proposed march to the Convention Hall would have to be abandoned and every man get to the hall as best he might between showers. However, Jupiter Pluvius was propitious for once and at the proposed hour of starting the sky cleared and the procession was able to make a start from the Baltimore with some show of ceremony.

The procession was headed by the Third Missouri U. S. Volunteer Band, which had been serenading the plumbers in the rotunda of the Baltimore for an hour or so before the start. Following the band was Mr. Kirchoff, of the New York delegation, with his well known flag, a beautiful silken banner which he had made and presented to the New York delegation and which he has carried at every convention since.

President Tierney, who is somewhat under the weather, Vice-President Hornbrook and Treasurer Goodman rode in a closed carriage, and following the carriage on foot were the delegations somewhat in this order: Kansas City, City of New York, Baltimore, Washington, Indiana, Ohio, Milwaukee, Philadelphia, St. Louis, East St. Louis, Mahoning Valley Association (10 delegates), Minnesota, and last but not least the Kansas delegation, bedecked with sunflower badges and waving Carrie Nation hatchets.

There were many stragglers, and the Kansas City badge was conspicuous in all parts of the line, the K. C. men evidently not wishing to leave their new found friends even for a few minutes.

The procession entered the Convention Hall to the applause of the ladies who filled the galleries and lent charm to the scene.

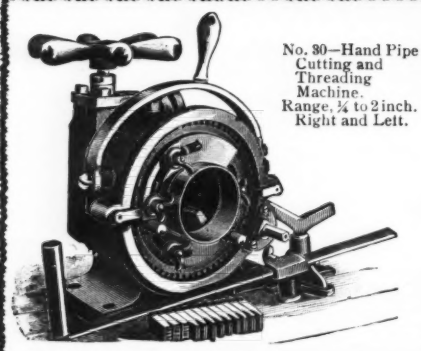
Music Hall, the scene of the M. P.s' deliberations is a snug little place, just comfortably holding the delegates, every man of whom, it is safe to say, was present at his seat for the opening of the convention.

The Hall was patriotically decorated with the national colors, two immense flags being draped over the entrance and the galleries being hung with festoons of red, white and blue bunting. The stage was a mass of bunting and the whole scene was such as to inspire enthusiasm.

It took some time for the delegates to find their places, which were indicated by triangular bannerets hung from the ceiling. The first diversion was the introduction by Ex-President Doyle, of a ten-year old colored boy named George Bailey, who was installed as a mascot and instead of a gavel

P. TIERNEY, ESQ., PROVIDENCE, R. I.

Elected Vice-President National Association of Master Plumbers at
New Orleans, La., 1899, and President at
Baltimore, Md., 1900.



No. 30—Hand Pipe Cutting and Threading Machine. Range, ¼ to 2 inch. Right and Left.

SAVE TIME AND LABOR. WITH A

FORBES' PATENT DIE STOCK

and one man you can cut off and thread a 12-inch pipe with ease. Smaller sizes proportionately easy.

Ratchet Drills, Ratchet Die Stocks, Malleable Iron Pipe Vises

MANUFACTURED BY

THE CURTIS & CURTIS CO.

18 GARDEN ST., BRIDGEPORT, CONN.

bore a Carrie Nation hatchet as a symbol of his authority. Before the meeting came to order the famous Third Regiment Band played numerous selections which caught the fancy of the delegates in their seats and the ladies in the gallery.

President Tierney was supported on the platform by Ex-Presidents John Trainor and W. H. Doyle and Treasurer Wm. E. Goodman. The convention was called to order at eleven sharp by the president, and Eph. Doherty and C. L. Smith, of Kansas City, were appointed sergeants-at-arms. The president then introduced W. L. Hudson, president of the local association, who welcomed the visitors to Kansas City and introduced L. C. Boyle, ex-attorney general of Kansas, who, on behalf of the mayor, made an excellent and dignified address which spoke well of the delegates and of the city to which they came. To them he gave credit in a jocose manner for the movement which led to the closing of the saloons on Sunday, and said that all the time the plumbers should be in town, Kansas City would have its "Sunday close" on.

Ex-President John Trainor, of Baltimore, accepted the hospitality of the city as extended by Mr. Boyle, and like all that Mr. Trainor does, it was well done.

Capt. Henry Goss, of Kansas City, then presented Mrs. E. D. Hornbrook, chairwoman of the local committee of ladies, who presented a gavel made from the rostrum of the Convention Hall in which Mr. Bryan was nominated for the presidency. On behalf of the president Mr. Doyle accepted the gavel. President Tierney then announced that on account of illness he did not feel strong enough to proceed with the convention, and called Vice-President E. D. Hornbrook, of Kansas City, to the chair and turned the meeting over to him.

Mr. Hornbrook then announced the program of entertainment arranged for the delegates and their ladies.

The report of the committee on credentials was then called for, and it was presented by H. H. Highlands, chairman, of Muncie, Ind., who presented enough delegates to open the convention, and said the full report could not be made until the states and locals had handed them all in. One Murphy, he of Milwaukee, wanted the report omitted, but another Murphy, he of Chicago, put the trolley on the wire again and progress was resumed.

H. F. Westcott, of Albany, N. Y., asked how to settle the question of the per capita tax, whether to settle with the credential committee or with the convention, and tried to state the condition of the New York state delegation. He was interrupted by Mr. Healy, of Indianapolis, who moved that the report of the committee on credentials be accepted as far as read. His motion was supported and prevailed.

On motion of John Trainor a recess was taken until two o'clock, and it was recommended that all delegations whose credentials were not accepted should arrange with the committee.

It was attempted to control the attendance at the convention by ticket, no one to be admitted who should not have a proper ticket of admission either as a delegate or an alternate.

First Day—Second Session.

It was 3:17 p. m. when Chairman Hornbrook called the convention to order for its second session, the issuing of tickets having caused a troublesome delay, although everything was done which could be done to facilitate the work. It was an herculean task at the best, but the system insured that none but delegates entitled to seats were admitted to the floor.

Mr. Highlands reported that the committeen on credentials had not yet received the list from the printer, and further time was granted them.

AUDITING COMMITTEE.

The chairman appointed an auditing committee, consisting of R. J. McNally, of Philadelphia; W. H. Halsey, of Milwaukee, and O. S. Kendall, of Worcester, Mass.

RESOLUTIONS COMMITTEE.

On motion of Charles T. Byrne, of Chicago, a committee on resolutions was appointed by the chair to whom all resolutions should be referred after reading without debate.

The following were appointed:

Charles T. Byrne, of Chicago; Joseph A. Weldon, of Pittsburg; Thos. F. Gaynor, of New York; O. A. Blethen, of Minneapolis, anl F. P. Edson, of Topeka, Kan.

T. P. Watts was selected reading clerk, and upon his taking the platform he was greeted with cheers.

RESOLUTIONS, ETC.

From the Ohio State Master Plumbers' Association, resolutions were presented to supercede the New York Conference resolutions by adopting resolutions demanding that manufacturers and dealers sell plumbing supplies to members of the National Association only.

The Connecticut State Association presented a resolution asking that dealers and manufacturers give members of the national association an advantage of 10 per cent discount than to non-members.

The Pittsburg Association presented resolutions more clearly defining those entitled to be called master plumbers, by providing an addition to the New York Conference resolutions a new section authorizing the appointment of local investigating committees who should get affidavits as to the qualifications of those entitled to engage in the plumbing business.

The New York City and Boroughs Association presented a resolution condemning the publication in trade papers of net prices and discounts, and that manufacturers and dealers be requested to withdraw their advertisements from such papers as persist in the publication of such information.

The reading of this resolution was greeted with applause.

John Gormly, of Philadelphia, was the author of the following resolutions:

WHEREAS, The greatest evil in the plumbing business to-day arises from foolish competition, by which no profit is left in the best portion of the business, and

WHEREAS, The dealers in and manufacturers of plumbing materials are suffering as well as ourselves, because of this evil, and

WHEREAS, We believe the remedy for this state of affairs may be found in a joint conference of dealers, manufacturers and plumbers,

THEREFORE BE IT RESOLVED, That the national executive commitees of the dealers and manufacturers, and the master plumbers, be requested to take the matter up for adjustment if possible by joint action.

A plan is suggested by which the plumber may assist the dealer and the dealer assist the plumber, viz:

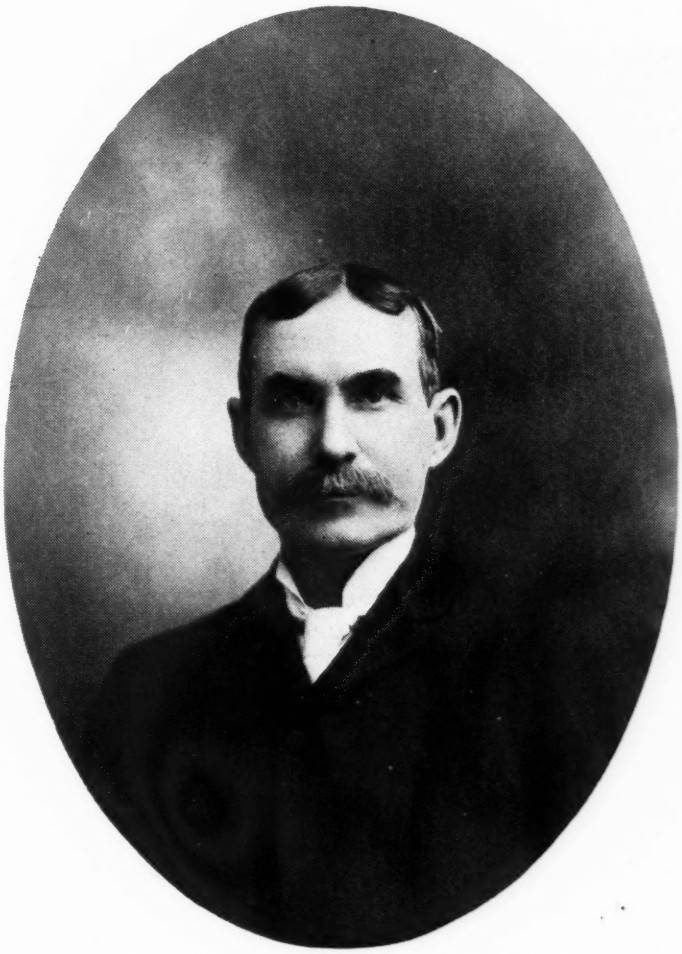
The plumber will be pledged to deal only with the dealers who keep their part of the agreement, to be entered into.

This gives the dealer a chance to control his own membership; the dealers complain that their own men will agree to do things and then do not keep to the agreement.

The dealer will agree to give 20% advantage to the plumber who is on the National Plumbers list.

This will force plumbers into the National Association, and no man could afford to stay out of it, with 20% handicap in prices.

The National Association of Master Plumbers will require each member to add a certain percentage of profit on all work on which he bids. This percentage will allow a fair living price, but will not be extortionate.



JAMES J. CONROY, PROVIDENCE, R. I.

Elected Financial and Recording Secretary of the National Association of Master Plumbers at Baltimore, June 14, 1900.

The plumber who does not so add the percentage as required by the National Association will be omitted from the plumbers list which goes out monthly telling who is to receive the 20% advantage in prices.

Each local association will establish a committee to hear and decide questions of dispute. These men shall be sworn to do justice.

Any plumber reported to the local committee as bidding below the National percentage of profit, and found guilty, must be omitted from the list of those worthy of the special 20% in prices.

Any plumber found guilty of buying from a dealer who is not on the dealers' list of reputable dealers, will also be debarred from the special discounts.

The plumbers are benefited by having cut-throat competition stopped. Every man will then make a living profit on all competitive work. The dealer is benefited by knowing that every man will make enough to pay for his goods and have a living margin for himself.

The dealer is also benefited by having the plumber refuse to buy of dealers who do not keep faith with the dealers. This strengthens the hand of the dealers' association.

No plumber could do business with a handicap of 20%. He must therefore deal right or go out of business.

All cases adjudged against a plumber by the local committee may be appealed to the National Committee by the parties in dispute putting up money enough to pay all costs of a national conference on the case in question; the loser to forfeit the money he has put up. This will pay the expense of adjusting each case. The appeal to the National prevents local spite from working injustice to members.

Mr. Gormly also offered a resolution that plumbers deal with owners only, and on bids made to others than owners or their agents, 10% be added to regular prices.

A resolution was presented requiring that delegates be elected to the National Convention from those in good standing in locals during the last half of the term.

A resolution was presented providing for the election of a sergeant-at-arms in the same manner that the executive committee is elected, and that he shall be the sergeant-at-arms to the executive committee and the national convention.

The California State Association presented several resolutions. One asked for the appointment of state organizers, each State to be authorized to select its own organizer, his expenses to be paid by the national treasury. Another resolution asked for the issuance of membership certificates.

The California association also ask an amendment to the New York conference resolution, so that the rule that plumbers should only sell material which he shall install should be made to apply to non-members by making such action illegitimate.

They also asked that dealers refrain from going security directly or indirectly for irresponsible plumbers.

Fred Fox, Jr., of Chattanooga, Tenn., presented a resolution favoring the retention as members in the association only those who pay their just and honest debts.

From Ed. Braden, Jr., of San Antonio, a telegram was read expressing greetings and regret at not being present.

The Lawrence Gas Fixture Mfg. Co., of Philadelphia, by Benj. C. Doyle, invited the inspection of their samples in room 137, at the Hotel Baltimore.

Swift Co., packers, invited the delegates to visit their establishment.

John L. E. Firmin, of San Francisco, chairman of the essay committee, announced that he had but two essays, one by James Ahern, of Hartford, Conn., entitled "A Plea for the New York Conference Resolutions," which was printed in our second edition of Tuesday; the second essay was written by Mr. Firmin himself, and was entitled "Ventilation versus Non-Ventilation," which was read by the author. It proved to be a reply and controversion of the articles by Mr. J. Pickering Putnam, as published in "Domestic Enginering."

Mr. Doyle moved to adjourn until Wednesday morning.

Mr. E. J. Hannan, of Washington, moved to amend so that when adjournment is had it be to meet in executive session at 10 o'clock Wednesday morning. The amendment prevailed, and the convention went out of session at 4:50 p. m.

THE DRIVE.

From the convention hall the delegates went to the Hotel Baltimore, where every public conveyance in Kansas City had been chartered to take the convention driving. The ladies were already installed in carriages and as soon as the men were entrained the cavalcade started, to the amazement of every beholder on the route. No one could have believed the convention would have made such a display. Tally-ho, brake, surry, brougham, buck-board and almost every other style of cenveyance on wheels was pressed into service, and the procession strung out interminably. On one tally-ho J. M. Healy, of Indianapolis, had a coaching horn as long as he was, and as soon as Healy's horn blew a blast, every cliff-dweller and liver in the valley came out to see the plumbers on parade. How the pickaninnies danced and crowed! They were as pleased as little children always are with life and motion, and the plumbers and their ladies were as pleased to see the little colored people. The carriages took a course which showed Kansas City off to perfection. Residence after residence of costly architecture was passed in review; the visitors were also much interested in the numerous small homes, tastefully designed and comfortably built. Gladstone Boulevard, Cliff Drive, Independence Avenue, and other attractive parts of the city were shown. The rolling hills and valleys were a constant source of joy to the visitors. The famous Paseo, with its little lake, its fountain, its Pergola and flowers, were all beautiful. The drive ended at Westport, where an exhibition was given by the crack team of Captain Hale's fire-fighters. The horses were the team which went to the Paris Exposition and won the championship of the world, and three of the crew handling the horses were also abroad. Really those horses were wonderful. They did everything but talk. With bugle calls to guide them, they went through amazing evolutions which astonished the delighted visitors. And finally, when they dashed through a framework of fire to get to their stations on the truck, they won the unstinted admiration of everybody.

The return drive to the hotels and preparation for dinner were often punctuated by the remark: "What a wonderful exhibition!"

Reception.

The evening reception was a monumental success so far as the ladies could make it so. The committee of arrangements had labored faithfully to make it an occasion long to be remembered. The parlors of the Baltimore were decorated with admirable taste by one of Kansas City's florists, and it was indeed a bower of loveliness. Let not man any longer make fun of womankind's fondness for lingering before the glass, for it has been demonstrated that when there is a reception on the tapis the women-folk can change from street dress to function gown in wondrous short time.

The late return from the ride made the reception a little late in starting, but the guests lost no time in getting down to the enjoyment of the occasion, once they arrived. In spite of the fact that many of the guests were dressed for a very formal affair, the reception was quite informal from the first, and acquaintances and strangers were soon chatting merrily.

An excellent musical program had been provided and was rendered to the delight of all. Following is the program:

MUSIC.

(a) From Flower to Flower.....Kullak
(b) To a Water Lily.....McDowell
Mr. Herbert Sisson.

(a) Berceuse from Jocelyn.....Godard
(b) Spring.....G. Nenshel
Mrs. Mabel Haas Speyer.

Fantaicie Caprice..... .....Vieuxtemps
Mr. Francois Boucher.

(a) Who'll Buy My Lavender.....German
(b) Four Leaf Clover.....
Mrs. Van Vaulkenburgh.
Mr. Herbert Sisson, Accompanist.

All of the ladies of the auxiliary had worked hard to make the affair a success, but to the following ladies, as members of the special committees, the thanks of the guests are especially due for an enjoyable evening:

Decoration Committee—Mrs. Kelly, Miss J. Cotter, Miss Ella McDonald.

Music Committee — Mrs. McCutcheon, Mrs. Frost, Mrs. Ryle.

Luncheon Committee—Mrs. Hornbrook, Mrs. Dow, Mrs. Kirtley, Mrs. Richardson and Mrs. Dougherty.

Refreshment Committee — Mrs. W. G. Ashdown, Mrs. J. L. Ryle, and Mrs. Walter Good.

The Ladies Present.

These are the names of the ladies from abroad who graced the occasion with their presence:

Mrs. P. M. Murphy, Chicago.
Mrs. P. J. Foley, Chicago, Ill.
Miss Tierney, Hartford, Conn.
Miss Sarah Tierney, Providence, R. I.
Mrs. J. W. French, Boston.
Miss Rothrock, Baltimore.
Miss Carey, Baltimore.
Mrs. J. W. O'Brien, New York.
Mrs. G. C. Smith, Denver.
Mrs. T. J. Tuomey, New York.
Mrs. Irwin, New York.
Mrs. Reynolds, New York.
Mrs. Westcott, Albany.
Miss Brady, New York.
Mrs. I. J. Brown, New York.
Mrs. J. A. Rossman, New York.
Mrs. C. H. Cronin, Boston.
Mrs. F. O. Johnson, Boston.
Mrs. F. F. Garvey, Boston
Mrs. J. C. Kelly, Boston.
Mrs. J. F. Gearen, Sioux City.
Mrs. Hoben, Philadelphia.
Mrs. J. H. Macauley, Providence.
Mrs. J. S. Fuller, Providence.
Mrs. J. M. Heatherton, New York.
Mrs. Shumway, New York.
Miss Loretto Martin, Fort Wayne.
Mrs. H. W. Jimerson, Minneapolis.
Mrs. John Kirkley, Baltimore.
Mrs. John M. Addy, Pittsburg.
Mrs. I. N. Eaton, Wilmington, Del.

W. E. GOODMAN, MILWAUKEE, WIS.

First elected Treasurer of the National Association of Master Plumbers at Cincinnati in 1891, and re-elected without opposition each year since.

Mrs. A. H. Shafer, San Antonio.
Mrs. Charles Breyer, Chicago.
Mrs. J. W. McCrea, Baltimore, Md.
Mrs. F. A. Brandt, St. Louis.
Mrs. A. F. Fettig, St. Louis.

Mrs. E. D. Hornbrook, Kansas City

Mrs. E. C. Rosenthal, St. Louis.
Mrs. Wm. Ryffel, St. Louis.
Mrs. J. P. Carroll, St. Louis.
Mrs. W. C. Abel, St. Louis.
Mrs. W. Burke, St. Louis.
Mrs. H. P. Cahill, Akron, O.
Mrs. Louis Poplowsky, Cleveland.
Mrs. Wm. B. Coffee, Tacoma.
Mrs. Wadsworth, Cleveland.
Mrs. Cleveland, Cleveland.
Mrs. Taylor, Aurora, Ill.
Mrs. J. M. Healy, Indianapolis.
Mrs. A. J. Walker, Butte.
Mrs. T. G. Turner, East St. Louis.

Mrs. W. G. Ashdown, Kansas City.

Miss Zoie F. Turner, East St. Louis.
Mrs. F. R. Dengel, Milwaukee.
Mrs. J. M. Fassel, St. Louis.
Mrs. J. H. Beasley, Pittsburg, Kan.
Mrs. Henry Cooper, Springfield, Mo.
Mrs. Carl Graeber, Lawrence, Kas.
Mrs. Ann Dailey, St. Louis.
Mrs. T. F. Hanley, Chicago.
Mrs. Charles H. Frederick, Baltimore.
Mrs. August Eidman, Baltimore.

Some Prominent Ladies.

One of the pleasant features of our annual convention is the attendance of ladies. The elaborate preparations which are made for their entertainment have made many conventions delightful memories, and that many ladies come to the convention city year after year is good evidence that it is looked upon as a pleasant vacation. Many strong friendships have been formed among ladies attached to the plumbing fraternity, and at succeeding conventions these friendships are renewed and made stronger, while new ones are always formed. We take pleasure in presenting portraits of some of the ladies who have helped make this and previous conventions notable by their presence. We are also able to present the portraits of Mrs. E. D. Hornbrook and Mrs. W. G. Ashdown, two ladies who have done much to make the visit of ladies to Kansas City so pleasant.

Mrs. John Trainor, Baltimore.

Our Hosts.

Kansas City plumbers seem to possess the mystic art of being in several places at one and the same time. At least one would infer as much, since wherever you turn, there is one of the local men ready to be your companion, guide and own familiar friend. The secret of their perennial on-hand-edness is the fact that they have constituted themselves a committee of the whole to look after their guests. Kansas City local has certainly done itself proud, and it is the duty of every delegate to tell every local plumber he meets how good it is to be here. If you happen to be in the neighborhood of a plumbing shop drop in and tell the proprietor what you think of Kansas City's enterprise. Here is a list of the good plumbers of Kansas City, each of whom has worked like a beaver to make the convention a success:

Mrs. W. H. Doyle, Philadelphia.

Allison, Hudson Buss, 1426 Grand Ave.
Ashdown & Little, 519 E 12th St.
Cathcart & Marvin, 919 Broadway.
R. T. Connell Co., 1221 Grand Ave.
Corcoran & Dow, 17 E Missouri Ave.
Cotter, McDonnell & Co., 714 Wyandotte Street.
James Cotter, 923 E. 12th St.
John Cotter, 211 E. 14th St.
J. M .Cross, 411 W. 7th St.
Cunningham Plumbing Co., 408 W. 12th St.
Curley & Zimm, 3251 Troost Ave.
R. L. Dawson, 916 Wyandotte St.
Ephraim Doherty, 1223 McGee St.
W. C. Dougherty, 602 Prospect Ave.
Farley Bros. Heating & Plumbing Co., 1409 E. 12t St.
Farley Bros. Heating & Plumbing Co., Branch No. 1, L. A. Farley, Mgr.
Henry Felleman, 2318 E 15th St.
Goss Heating & Plumbing Co., 1016 Walnut St.
Walter Good & Son, 1204 E. 24th St.
Alex Gray, 115 E. 10th St.
Fred Hacker, 412 Main St.
Hanson & Wright, 116 E. 9th St.
E. D. Hornbrook, 1212 Main St.
H. M. Joergens, 415 E. 15th St.
C .F. Kelly, 26th St. and Prospect Ave.
George P. Kirtley & Co., 1213 Walnut St.
Mallon & Mallon, 1214 E. 9th St.
Miller & Haljerson, 317 W. 9th St.
T. P. Maloney, 633 Prospect Ave.
J. V. Pardee, 3938 Main St.
J. H. Richardson, 621 Independence Ave.
W. W. Richardson, 312 Westport Ave.
J. L. Ryle & Co., 22 W. 12th St.
W. W. Scannell, 904 Troost Ave.
C .P. Schroeder, 1607 Grand Ave.
Sivewright & Smith, 2405 E. 12th St.
Wm. Warmholz, 927 Mulberry.
Frank Welch, N. E. cor. 14th and Walnut Streets.
Dent Yates, 1019 Grand Ave.

List of Delegates.

ALABAMA—Huntsville, A. J. Murdock; Mobile, S. D. Copeland; State Association, Thos. J. Young, Jno. R. Young, J. W. Blake.

ARKANSAS—State Association, August Reichert, Ft. Smith; M. B. Saunders, Little Rock.

CALIFORNIA—San Francisco, John L. E. Firmin; Los Angeles, H. J. White.

COLORADO—State, Geo. E. Smith, W. B Crean; Denver, Jas. J. Johnson, W. H. Hensler, Geo. Loser, Jno. R. Parry, J. H. Winters, Thos. H. O'Brien, J. F. Daniker.

CONNECTICUT — Bridgeport, M. W. Mainwaring, L. H. Mills.

DELAWARE — Wilmington, Jas. F. Traynor, Isaiah N. Eaton.

DISTRICT OF COLUMBIA—Washington, Walter D. Nolan, Ed. J. Hannan, ex-officio; Chas. A. Barrick. G. W. Williamson, James Lockhead, Henry Allen, Chas. Breisford.

ILLINOIS—State Association, Canton, Wm. H. Inker; Aurora, B. P. Kirsch, Fred B. Taylor; East St. Louis, Ed. Metzger, Timothy Keckham; Elgin, S. F. O'Flavaty, J. R. Scanlon; Bellville, W. J. Schlegel; Peoria, E. B. Hazen, C. W. O'Neill, John H. Boyd; Ottawa, Wm. Wilson, J. J. Wafer; Illinois State, D. J. Rock, E. J. Madden, J. M. Dougherty; Chicago, P. M. Murphy, D. J. Hickey, president; C. J. Boyd, T. C. Boyd, J. W. Brunt, Patrick Sanders, C. C. Breyer, J. J. Wade, A. W. Wills, John G. Roland, J. A. Denniston, J. B. Ryan, Jas. P. Heeney, Thos. F. Hanley, J. H. Boyd, L. R. Bain, P. J. Thielen, Joseph Hanson, W. F. Knauss, Jos. Scheu

Some Faces We Miss

Heir of the blessings which mankind has won for thee,
Blessings achieved through privation and skill;
Child of the Present,—what others have done for thee,
May'st thou excel by deeds loftier still!

Joseph A. Macdonald

Born, Londonderry, Ireland, May 15, 1839. Chosen member of the Executive Committee of the National Association of Master Plumbers at Deer Park, Md., in 1886.

Elected Vice-President at Denver in 1890. Elected President at Cincinnati in 1891. Died October 18, 1891, while serving in that office.

Robert Griffith

Born, County of Monaghan, Ireland, March 3, 1848. Elected Vice-President of National Association of Master Plumbers at Pittsburg in 1889. Elected President at Denver in 1890. Died March 9, 1900.

James Meathe

Born, Tullamore, Ireland, April 7, 1844. Chosen a member of the Executive Committee of the National Association of Master Plumbers at Detroit in 1894. Elected President at Philadelphia in 1895. Died September 21, 1899.

er, John Sanders, Paul Jaeschke, J. L. Corcoran, N. P. Molter, Alfred Jones, Jacob Adler, Jos. Reilly, Paul Redieske, Chas. T. Byrne, J. W. Brown, J. O. Sawkins, state vice-president; Evanston, Benjamin Vodde.

INDIANA—State Association: W. J. Freaney, Indianapolis; Byron E. Hattersley, Ft. Wayne; H. H. Highlands, Muncie; Anderson, Frank McCall, Walter H. Powell; Ft. Wayne, Emmett Martin, F. J. Zimmerly; Muncie, John R. Retherford, Ira Jones; Indianapolis, John W. Marshall, Geo. F. Kirkhoff, Chas. Aneshaensel, Jr., Jas. M. Healy, W. W. Wilcox, C. W. Meikel; Marion, R. P. Whisler; Richmond, E. W. Craighead; South Bend, Thomas Williams, James Aslin.

IOWA—Cedar Rapids, E. O. Edson; State Association, J. F. Gearen, Sioux City; H. W. Noble, Sioux City; John E. Allen, Des Moines; Fred Wernentin, Jr., Davenport; J. Burnside, Des Moines; D. W. Fitts, Sioux City; A. H. Walker, Des Moines.

KENTUCKY—Louisville, A. M. Ramsey, J. Isaacs, T. P. Watts, H. L. Nevin, M. J. Duffy.

KANSAS—State: C. States, Carl Graeber, A. P. Elder, F. P. Edson; Iola, Ira Patterson, W. H. Root; Topeka, E. A. Chaney, J. K. White; Kansas City, Kas., Geo. C. Hargreaves, Ed. Draper; Pittsburg, Jno. Beasley, G. E. Hollinger; Wichita, C. E. Wilkie, C. A. Preston; Leavenworth, Jas. Foley, W. W. Tholen.

MASSACHUSETTS—State Association: Daniel Shannon, Boston; Frank O. Johnson, Boston; O. S. Kendall, Worcester; Lowell, Chas. H. Hobson, G. P. Green; Boston, C. H. Cronin, R. F. Brown, D. Shannon, E. C. Kelly, W. A Tucker, E. W. Cox, J. C. Kelly, A. E. Touchet, T. J. Tute, T. F. Garvey, J. Manning, L. Jacobs, D. Craig, J. W. Cosden, M. J. Keane, J. Warren French.

MINNESOTA—State: St. Cloud, J. P. Besemus, F. E. Kreatz, J. P. Adamson, Jno. R. McKee, O. H. Blethen; St. Paul, Jno. H. Shea, S. A. Hill, P. W. Hudner, Jno. McQuillan; Minneapolis, W. S. Bayley, J. P. Courtney, F. H. Schuler, G. W. Hineline, A. W. Scott, H. W. Jimerson, J. M. Jacobson.

MISSOURI—St. Joseph, C. L. Bristol, Samuel Powers.

MISSOURI — State Association: J. W. Comerford; Jefferson City, H. A. Jeffreys, W. H. Jenkins; Joplin, Wm. Crombie, Dan Hamilton; St. Louis, F. A. Brandt, Jeremiah Sheehan, ex-officio; John J. Foy, ex-officio; Jas. P. Carroll, ex-officio; L. McNamara, A. F. Fettig, John Gilmore, E. C. Rosenthal, O. J. Gerhard, C. Dempsey, J. J. McCue, Wm. Burke, E. A. Shuster, J. M. Fassel, J. J. McNary, O. B. Hervers, Wm. Ryfel, J. F. Corrigan, Walter Abel, P. H. Callahan, Phil Schmitt; Kansas City, C. L. Smith, Eph. Doherty, G. P. Kirtley, John McDonald, E. D. Hornbrook, W. L. Hudson; Springfield, J. Lawler, H. Cooper.

LOUISIANA — State: C. A. Hartwell; New Orleans, J. A. Aitkin, J. D. Burghardt.

MAINE—Lewiston, John B. Smith.

MARYLAND — Cumberland, John B. McFarlane, R. R. Deetz; Baltimore, Jno. Trainor, P. T. Barry, Jos. C. Mitchell, Wm. H. Rothrock, D. N. Sullivan, August Eidmann, Charles H. Frederick, L. H. Bennett, E. J. Burke, W. J. McCrea, Joseph Kirkley, Arthur Schlegle, Lloyd Mitchell, P. A. Sullivan.

NEBRASKA—Omaha, Wm. Bellamy, G. K. Black.

MONTANA—State Association: John A. Collins, Andrew J. Walker, Butte,

NEW HAMPSHIRE—Nashua, C. H. Avery, F. O. Ray.

NEW YORK—Albany, Jno. E. Dugan; New York State, C. B. Huck, Chas. Geiger, Horace F. Westcott, J. A. Rossman, New York City, I. J. Brown, A. H. Brown, T. F. Gaynor, John Mitchell, S. L. Malcolm, B. F. Donohue, John Renehan, I. O. Shumway, Philip Brady, Wm. Kirchoff, T. J. Tuomey, Ed. Brady, J. W. O'Brien, W. J. McDermott, J. A. Rossman, T. J. McCormick, T. F. McCaul, J. F. Kelly, J. T. Coyle, M. J. O'Brien, T. S. Cochrane, Jr., F. Reynolds, J. W. Cooney, C. A. Walsh, Wm. Tobin, E. J. Riordan, P. Euell, C. Lucker, J. Morton, H. W. Reynolds, A. Bellford, D. Donegan, M. F. Gleason, G. W. Smythe, M. Fallon, W. M. Brown, E. McDonald, W. Eierman, L. Gfroerer, H. M. Noble, J. F. Rogers, Thos. Freeman, H. A. Bauman, G. M. O'Connor, Eugene Kelly.

OHIO—Akron, H. P. Cahill; Cleveland, H. Ward Daykin, Chas. E. Armour, John Leese, Jos. B. Couture, Eb. Ellen, F. A. Wadsworth, Theo. Poplowsky. Matthew Dettelbach, E. E. Hill, William H. Cleveland, Louis Poplowsky, ex-officio; State Association, R. B. Moodie, Dayton; John L. Riley, Dayton; Robert Raitz, Toledo; Mahoning Valley, Louis B. Scheible, F. F. Bentley, W. J. Scholl; Toledo, W. G. Walker, J. C. Meissner, Thos. Kewley; Springfield, R. H. Desormoux.

PENNSYLVANIA— State Association, Louis J. Sommer, Philadelphia; James B. Doyle, Scranton; Robert J. McNally, Philadelphia; Erie, W. J. Butler, M. J. Campbell, Geo. B. McIntyre; Harrisburg, Chistian Nauss, M. F. Saul; Philadelpnia, Geo. F. Uber, Wm. H. Doyle, A. M. Hicks, Wm. McCoach, F. P. Brown, J. E. Eyanson, S. Louis Barnes, R. J. Hoben, Howard Smith, James H. Shea, C. W. Groeling, E. Frank Paullin, Frank W. Henry, Richard H. Watson, E. H. Mackay, Harry Mellon, T. J. Barry, Wm. Harkness, J. P. Cleary, M. F. Elliott, D. R. Burns, H. L. Righter, John McNally, A. G. Bond, S. W. Barnes. J. Gormly, I. T. Hirst, J. J. Harnett, H. Johnson, I. B. Thorn, Jos. Hubley, G. Krouse, Jr., Frank Welsh, Wm. H. Davenport, H. B. Lentz; Pittsburg, Mack Snively, S. S. White, John M. Addy, M. J. Counihan, F. J. Scheib, Jos. A. Weldon, James Hay, W. N. Sauer, T. R. Marshall, Robert Henderson, J. L. McShane, W. J. Elkin.

RHODE ISLAND—Providence, Thomas L. Phillips, John H. Macauley, John E. Graham, John J. Shanley, W. M. Congdon, J. S. Fuller, Jno. F. Keenan, Henry H. Dauphinee, Jas. C. Conroy, ex-officio, P. Tierney, ex-officio.

TENNESSEE—Chattanooga, Fred Fox; Knoxville, J. A. Ahler, F. A. Engert.

TEXAS—M. C. Booker, John W. Thiel, A. H. Shaffer, S. C. Carroll.

WASHINGTON—W. B. Coffee, James Maxwell, Ben Olson

WISCONSIN—F. R. Dengel, Chas. Polacheck; Appleton, W. J. Patterson; Milwaukee, E. Grassler, Aug. Rheins, H. Lippert, J. Schuh, Phil. Fuchs, E. F. Henoch, C. McNally, Wm. Halsey, E. Dillman, J. Stemper, Phil. Murphy, J. R. Williams, W. E. Goodman, ex-officio.

Second Day—First Session.

The beautiful weather is still with us, perfectly suited to the requirements of the ladies, but a little torrid in the convention hall. At 8:30 sharp the ladies started off on their all-day jaunt to Leavenworth, and about two hours later the men went into executive session at Music Hall.

At 1:30 p. m., a recess was taken until 2:30, the convention to reconvene in executive session.

Second Day—Second Session.

It was about 2:30 when the delegates reconvened in their second executive session of Wednesday. All the afternoon they toiled over the resolutions, the apprenticeship report of the executive committee taking much time. At seven o'clock they arose to meet at nine this morning, being still in executive session.

The Trip to Leavenworth.

Leavenworth, Kansas. (Special by Telephone): The delegates who had to swelter in the heat of the convention hall will be glad to know the ladies have had a most delightful trip. We left Kansas City about 125 strong, not over a dozen men being along. We had quite a wait at Kansas City, Kansas, where we transferred to the Leavenworth cars, and from there on the ride was idyllic. Between wheatfields and along the umbrageous banks of the muddy Missouri we rode,—a merry party indeed. The dresses of the ladies were exquisite, and lent a charm to this June day, perfect in itself, but gaining an added grace by such combined loveliness. We went up to the Fort where the beautiful parade ground and wide spreading trees made the scene memorable. The daughty warriors fell easy captives to the plumbers' dames, and were most kind and attentive. Thence we came to the Planters Hotel for a rest and luncheon. Then we went to the St. Mary's school and to the Old Soldiers' Home. All the party are well and having a good time. Too much credit cannot be given to the ladies' committee on management who have done everything to make the trip pleasant. We expect to arrive at our hotels about six o'clock, tired but happy.

The Ladies' Trolley Ride.

It was not the purpose of Domestic Engineering to leave the ladies of the convention in far-off Leavenworth yesterday afternoon, but time and the second edition wait for no man or woman. We therefore take up the chronicle of the ladies' doings where it was left off. Quite a number of the ladies were late in arriving at the hotel for their luncheon, having lingered at the fort after the first cars had started.

And it was no wonder, for a more beautiful spot would be hard to find. Situated at a bend of the Missouri, its broad acres of rolling lawns, offering an inviting rest under the ample shade of myriad trees. It was indeed a place to make one forgetful of time. Those of the party who kept with the leader took in the sights of the military prison, where several hundred poor fellows are locked up for offenses against the government. It was not a cheerful scene and the ready sympathies of the ladies were aroused.

Of the luncheon at the New Planters' your representative is not in position to write, having bolted it after the fashion of a newspaper man, and rushed out to assure the waiting world of men at Kansas City that their wives and sisters and sweethearts were quite well and having a good time, thank you.

However, it is safe to say that the luncheon was appreciated by the ladies, as was also the opportunity to pin back their wind-tossed locks.

On leaving the hotel, there seemed to be some confusion as to the plans of the committee for the afternoon's enjoyment, and this confusion resulted in the separation of the party; part going to the Old Soldiers' Home, and the rest to St. Mary's academy. The separation was unfortunate, but not at all to be wondered at, considering the size of the party.

Domestic Engineering's representative was with the party which visited the academy, and perhaps the best tribute he can pay to the graciousness of the entertainment accorded us by the sisters is to echo the oft-expressed regret of the ladies of the party that anyone should have missed the privilege. Something of the restfulness o fthe place seemed to take possession of everyone as soon as we entered the spacious grounds, and it was good to see the tired look fade from the faces of the ladies under the spell of the place.

The sisters had prepared refreshments for the party in the refectory, and after a dainty luncheon, we proceeded to the inspection of the academy and its grounds. It is indeed a charming spot for the cultivation of Christian womanhood.

A program had been prepared by the pupils for the entertainment of the visitors and even your representative, used as he is to surprises, marveled at the perfect ease, the skill and the talent of the young ladies who took part. There were several voices of rare quality and the skil of the recitationists and instrumentalists was exceptional. Following is the program rendered:

PROGRAM.

Chorus.....The Crimson Glow of Sunset Fades.
Instrumental Duo.....Salut a' Pesth
Recitation.....An Ideal Woman
Vocal Solo.....Gaily Chant the Summer Birds.
Recitation.... ....Finnegan to Flannigan
Vocal Solo..... .....Jerusalem
Vocal Solo.....Tit for Tat
Orchestra.... .....Review Parade

When we reached the Old Soldiers' Home the other party had alrealy departed for home, and it was thought best not to linger at the Home so we contented ourselves with a regretful glance at its beautiful grounds and sped away for home. It was quite 7:30 before the last lady, tired but happy, was handed down from the cars and made her way to her hotel; but there was about every one in the party the conscious air of superiority, as if to say to the men who stood admiringly by: "Well, gentlemen, we have had a great day, and we planned and carried it out all by ourselves. Say now, if you dare, that women folks don't know how to take care of themselves."

Third Day—First Session.

About ten o'clock the delegates went into executive session at Music Hall, and remained in an animated discussion until one-thirty. When they came out they came out they looked happy but had not fought out all the points of difference, because it was still in executive session when it adjourned until three. Immediately after adjournment local delegations went into caucus to decide whom to recommend as members of the new executive committee.

Second Session.

The convention came together soon after three and went into executive session.

The convention was in executive session but a few minutes, when the delegates rose and went into open session.

The auditing committee reported that they found the books of the treasurer correct. The report was accepted.

T. J. Cady, of Columbus, Miss., wired from Houston, Texas, that his oil interests prevented his attendance.

C. T. Byrne, of Chicago, moved that the report of the executive session be referred to the incoming president, with power to edit and have such parts published as he should think best. The motion prevailed.

Mr. Healy of Indianapolis interrupted the reading of the sanitary report by a motion that it be printed without reading, and his motion was adopted.

Another essay was presented but was ordered printed without reading.

The report of President Tierney was read. In it he detailed the work done by him during the year. He reported 31 violations of the New York Conference resolutions, 17 of which had been decided in favor of the plumbers; the others are being investigated. In all cases he had found Mr. Woodward and Mr. Torrance perfectly just in their action. In September a directory of members was published containing over 5,900 names. He reported having received an application for membership the Honolulu Master Plumbers' Association. The membership of the National Association is nearly the same as last year. Statistics of increases in membership were detailed.

Phil Murphy moved the adaption of the President's report and thanks be tendered him. It was carried.

Mr. Murphy moved to accept the Honolulu Association and it was so ordered.

Mr. Byrne moved the National Association appropriate $1,000 to assist in helping defray the expense of holding the convention in Kansas City, the money to be paid to the local association. The motion was carried.

Mr. Sheehan, of St. Louis, offered for his delegation an endorsement of John J. Foy's application for the position as superintendent of the construction of plumbing at the Louisiana Purchase Exposition. Mr. Byrne seconded the motion and it prevailed.

Mr. J. P. Courtney of the Minnesota delegation, offered a motion that in making up the list of master plumbers entitled to buy plumbing goods, it be not necessary to get the consent of all the jobbers in the locality. A motion was made by Mr. Byrne to refer it to the incoming executive committee. Mr. Courtney pled to have his motion carried, and have the question settled. The motion to refer was put, but it was close and a standing vote showed that it was desired to have it referred.

Upon the motion of Mr. Hannan it was voted that an appropriation be made and a committee to be appointed to carry out the pleasant task of securing a testimonial for President Tierney.

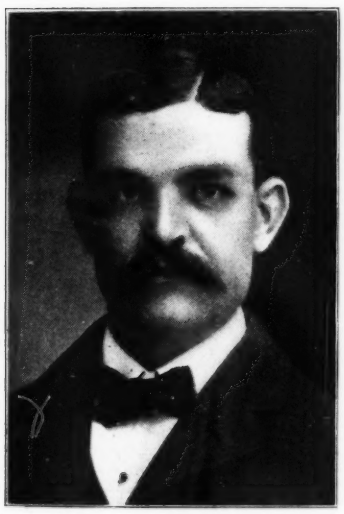
Chairman Hornbrook called for the election of officers and Ex-President P. M. Murphy, of Chicago, was asked to take the chair.

The chair appointed Frank Reynolds, of New York, as judge, and J. L. E. Firmin, of San Francisco, and D. J. Hickey, of Chicago, as tellers.

There was a great rush to nominate and second the nomination of E. D. Hornbrook, of Kansas City, as president of the National Association, and he was elected by acclamation.

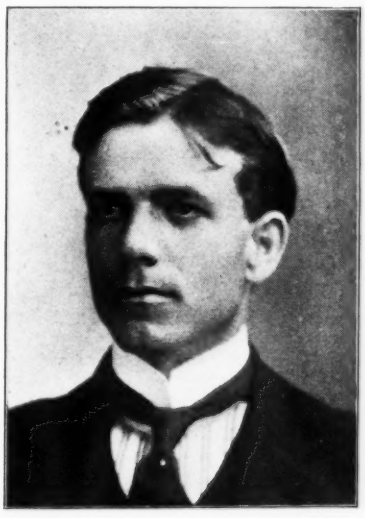
Mr. Sheehan and Mr. McKee were appointed a committee to escort the Presi-

Some Faces We Will Remember.



J. P. CUNNINGHAM,
Kansas City

ED. BLANCHARD, Plumbing Inspector,
Kansas City



MILES F. BULGER, Assistant Plumbing Inspector,
Kansas City.

dent-elect to the chair, and he was greeted with great applause. Mr. Hornbrook was glad he was alive, and he accepted the office, knowing the responsibility of the position. He would give the association the best he had and hoped to receive the endorsement of the association at the end of the year.

Nominations were called for the office of vice-president, and Mr. M. J. Counahan, of Pittsburg, presented the name of Joseph A. Weldon of his city.

Mr. McKee, of St. Paul, nominated Chas. Polacheck, of Milwaukee.

C. J. Boyd, of Chicago, Phil Murphy, of Milwaukee, H. H. Highlands, of Muncie, W. J. Dougherty, of Ottawa, Ill., F. A. Brandt, of St. Louis, seconded Mr. Polacheck's nomination.

Mr. Weldon's nomination was seconded by John Trainor, of Baltimore, Samuel Malcolm, of New York, Wm. McCoach, of Philadelphia, Jeremiah Sheehan, of St. Louis, J. B. Couture, of Cleveland, E. J. Hannan, of Washington, and C. B. Huck.

The nominations were then closed. The first vote was:

Joseph A. Weldon.. 146
Charles Polacheck.. 158

Total vote.. 304

The election of Mr. Polacheck was made unanimous by a motion by Mr. Weldon, and the vice-president-elect made a happy address of acceptance.

On motion of J. L. E. Firmin, Wm. E. Goodman, of Milwaukee, was unanimously re-elected treasurer, amid the admiring plaudits of the delegates.

The president announced that he had chosen Geo. P. Kirtley, 1213 Walnut Street, Kansas City, as secretary. Mr. Kirtley's selection was endorsed by the association and he accepted in a brief speech.

The following were announced as members of the executive committee:

P. Tierney, Providence.
Geo. Kirkhoff, Indianapolis.
Thos. F. Gaynor, New York.
Louis Poplowsky, Cleveland.
Wm. B. Coffee, Tacoma.
Chas. C. Breyer, Chicago.
J. Warren French, Boston.
Jos. A. Weldon, Pittsburg.
Geo. W. Walter, Baltimore.
Thos. J. Young, Mobile.
John J. Foy, St. Louis.

These state vice-presidents were appointed:

Alabama—Thos. J. Young.
Arkansas—J. A. Monaghan.
California—A. J. White.
Colorado—E. R. Doyle.
Connecticut—Edward Mahl.
Delaware—P. S. Walsh.
District Columbia—C. T. Barry.
Illinois—John B. Ryan.
Indiana—H. H. Highlands.
Iowa—John F. Gearen.
Kentucky—T. P. Watts.
Massachusetts—O. S. Kendall.
Michigan—J. W. Partlin.
Montana—A. J. Walker.
Louisiana—J. H. Aitkin.
Maine—John B. Smith.
Maryland—P. T. Barry.
Nebraska—G. K. Black.
New Hampshire—F. O. Ray.
New York—John E. Dugan.
Ohio—W. J. Schultz.
Rhode Island—John J. Shanley.
Tennessee—Fred Fox, Jr.
Texas—David Woodhead.
Washington—Ben Olson.
Wisconsin.—F. R. Dengel.
Hawaii—F. F. Davidson.

On motion of Mr. McKee, of St. Paul, the selection of the place of the next meeting was left to the executive committee, no city being ready to submit an invitation.

On motion of T. C. Boyd, of Chicago, the executive committee was given authority to adjourn the convention *sine die*, on Friday.

ACTION ON CONFERENCE RESOLUTIONS.

The executive committee's recommendation concerning the New York Conference Resolutions was adopted as follows:

"We advocate the New York Conference Resolutions, provided that they be enforced with all the understandings under which they were adopted. That it is the right of this body to place a blue list before the master plumbers of the country; and that it further be a local right to establish local agreements.

THANKS.

Votes of thanks were given to the Kansas City local, and the Kansas City ladies for their hospitality; to "Domestic Engineering" and the "Plumbers Trade Journal" for their daily issues, to the trade press, to the Elks lodge, the chief of the fire department and to the retiring officers.

Thursday Evening

Thursday evening the committee of arrangements had reserved for a trip to Electric Park, a popular Kansas City resort, where the chief feature of the evening was display of the marvelous effects of the electric fountain. It is a truly wonderful product of man's ingenuity, and the skill with which the different color effects were produced called forth loud applause.

In the theatre the stock company gave a production of "The Chimes of Normandie," and at the German village the plumbers took possession of the stage and proceeded to give a vaudeville show in which many of the older plumbers gave evidence of unexpected talent.

Friday

The Kansas City plumbers were "at home" all day Friday at Fairmont Park, a beautiful resort eight miles from the city. About 800 persons went out for a good time. After dinner a variety of out-door sports were enjoyed and a vaudeville including bag punching, boxing, etc., was provided. A pleasant incident was the presentation by Miss Brady, on behalf of the ladies of the New York delegation, of a silver fruit dish to Mrs. E. D. Hornbrook. She was also presented with a beautiful vase by the Boston ladies and from the same donors Mrs. Corcoran, also of the entertainment committee, received a candelabra.

Convention Notes.

After the mascot showed up the rain stopped.

The weather could not remain bad for the plumbers.

An all-day executive session makes dull news-gathering for the trade press.

Two charming Southern lassies are the Misses Rothrock and Carey, from Baltmore.

Our old friend Schuler, of Minneapolis, is with the Minnesota delegation at the Coates House.

The top of the mornin' to that bonny Irish lass, Miss Gladys O'Hara, of Washington, D. C.

Minnesota delegates are holding forth at the Coates Hotel. They have a good solid representation.

There are a few of the old guard left, and they enjoy reading our "stories of other conventions."

The Prest Heating Co., of Kansas City, was represented at the convention by B. C. Taylor, secretary and treasurer.

How we would miss John Carey, of Baltimore, should he stay away from a convention! Don't you dare do it, John

The Convention Hall is none too large for the delegates. It is airy, well decorated and convenient, but not very light.

Ed. Blanchard, Kansas City's inspector of plumbing, is a good fellow. There are many people who will recall his hospitality.

It was a delicate compliment the Hotel Baltimore paid its plumbing guests when it printed the association seal on the menu cards.

Late arrivals were James J. Johnson and George Loeser, of Denver. A washdown, or was it a washout?—on the road delayed their train.

Emmett Martin, of Fort Wayne, Ind., a plumber inventor, brought along a sample cellar trap and had it on exhibition at the headquarters hotel.

There are mysterious whispers of a beautiful souvenir to be presented to each lady before her departure. Get on the register in the ladies' room.

Alabama, a state which is rapidly pushing to thefront in commercial activity, is represented in the convention by J. W. Blake, of Huntsville.

The blotters distributed by R. Estabrook's Sons, of South Boston, Mass., showed the Sisson insertable soil pipe joint, sizes and price lists.

Uncle Sam Hopper, with the American Radiator Co., of Chicago, lives in Kansas City, and received the welcoming grasp of a multitude of friends.

The weather has been wilting during the day, but cool during the night. Music Hall proves rather warm and a little too small for comfort.

P. J. Callahan, of East St. Louis, Ill., is a poetic plumber who is here for pleasure only. He was the observed of all observers on the trolly ride.

Geo. M. Nash, representing Lamb & Ritchie, stuck tight to his post and few delegates got away without learning of the merits of the tin and lead lined pipe.

Calm, imperturable Crosby. The mainspring of association management. He keeps things going smoothly, although himself unheard and almost unseen.

T. F. McCall, a member of the New York delegation, has the honor of being the alderman of the 33d Assembly district in the New York City council.

It is a pleasure to see J. J. Wade at a convention again. How appropriate that he should be here when the protection idea is uppermost in the convention councils.

If we tried a month we could not express the gratitude we personally feel to the Kansas City boys for their royal entertainment. It is setting a record which it will be hard to beat.

W. S. Dickey, of the W. S. Dickey Clay Mfg. Co., of Kansas City, took those interested in the manufacture of sewer pipe out to the company's works Thursday morning.

Those Atlas match-boxes melted away like the dew in the morning. We thought enough were sent to supply the demand, but we could have givn out a hundred more.

Emmet Martin, of Fort Wayne, Ind., is a plumber of inventive mind who has perfected a cellar trap which he has on exhibition at the Baltimore. Get him to show it to you.

John Hopkins, of Memphis, Tenn., is a man who thinks. Mr. Hopkins is plumbing inspector of his city, and has been instrumental in getting a good workable code for his city.

The "Engineering Review," of New York City, is represented by Mr. Williams, of its Chicago office. Mr. Williams is a new recruit to this branch of trade journalism, but we think he is a credit to it.

Will the "Plumbers' Trade Journal" accept our congratulations upon its daily issue? Mr. Heatherton and Mr. Southworth have presented a spicy daily, which has been eagerly read by the visitors.

The H. Mueller Mfg. Co., of Decatur, Ill., have a table full of well displayed brass work in a corner of the Baltimore rotunda.

W. C. HEINRICHS

As he will travel through Illinois and Indiana.

It is in charge of Messrs. Fred. B. Mueller and W. C. Heinrichs.

Mrs. A. M. Ramsay's name should be added to the list of lady visitors present. Mrs. Ramsay's home is in Louisville, Ky., and she acompanied her husband who is state vice-president for Kentucky.

W. B. Coffee, of Tacoma, Washington, probably traveled as far as any one to attend the convention. He is all alone, but looks quite capable of looking after the interests of his State Association.

A. J. White, president of the Los Angeles, California, Association, took a four-days' trip to reach the convention. Every one should pat him on the back for the enthusiasm which brought him so far.

Former conventions have had the honor of the attendance of Harry Culbertson, of "American Engineering," of Chicago, but Harry gave Kansas City the go-by this year.

Mrs. H. W. Jimerson, of Minneapolis, is the only lady from Minnesota who accompanied her husband to the convention. Mr. Jimerson is vice-president of his State association and a thoroughly representative man.

The "Metal Worker," of New York, has been represented at this convention by Frank K. Chew, a newspaper man of the old-fashioned stripe, whom to know at all is to like and to know well is to grow very fond of.

Lives there a man with soul so dead that he has not discovered that there is a tempting refreshment booth just outside of the side door of the convention hall? The sawdust arena seems to have quite an attraction for some of the delegates, even during convention session.

Mr. and Mrs. Jno. M. Addy, of Pittsburg, Pa., are old-time convention goers, having attended all of the national convntions for a number of years. Mr. Addy is perhaps one of the oldest men in the association in point of experience, having been in the plumbing business over thirty-nine years.

The H. Mueller Manufacturing Co. are giving out a handsome and useful souvenir in the shape of a note book and card case combined. It is an expensive leather affair and save for a neat legend on the inside of the cover, has none of the earmarks of an advertising novelty. It is a little beauty.

P. J. F. Tumney, one of the owners of the Cleveland Bronze and Brass Works, of Cleveland, O., was at the convention Thursday morning, and called attention to the two waste holes in the Lyons patent anti-freezing stop and waste cock.

John Sheehan, of the H. Mueller Mfg. Co., of Decatur, Ill., is a son of that veteran plumber, Jeremiah Sheehan, of St. Louis. John travels Texas, Arkansas, Indian Territory and Oklahoma for his firm, and predicts a great future for the two territories.

N. B.—Take Notice! Look-a-here! ! You want to be at Electric Park this evening, no matter what your previous plans. The committee has made arrangements to take out a big crowd and give them the time of their lives. If you miss it you will regret it to your last day.

Messrs. Eisner and Fabian, of the Instantaneous Water Heating Co., of Chicago, are well pleased with the results of their exhibit at the Hotel Baltimore. Many plumbers were led to believe that it pays to keep a heater set up, connected, and ready to demonstrate to customers.

Chas. E. Styles, assistant general passenger agent of the Missouri Pacific, recently appointed to that office, proved himself the man for the place last night by helping the ladies pass a pleasant evening in the parlors. He has a fine reportoire of coon songs and sings them with much zest.

Lew Cross, of Kansas City, formerly lay-reader to the convention, and a hard worker in the interests of the association during the days when he was interested in the plumbing business, found many old friends at the hotels, but the absence of so many others made him reminiscent.

Fred Mueller, of the H. Mueller Mfg. Co., of Decatur, Ill., is loyal to his own city. He says Chicago, Decatur and St. Louis were the leading candidates for the world's fair of '93; that St. Louis got nothing; Chicago got the fair and Decatur got a transfer station in the public square.

The loyalty displayed by the delegates in sticking closely to business during those long executive sessions was creditable. There was plenty of temptation to be outside, where the light and air was better, but very few delegates absented themselves from the convention sessions.

During the executive sessions the newspaper men realized the full meaning of those beautiful lines of Watts:

"Should I be carried to the skies
On flowery beds of ease?
While them as fought to win the prize
Are left outside to freeze?

The Kansas City Master Plumbers' Association presented President Tierney a beautiful token just before he departed for Denver yesterday. Mr. E. D. Hornbrook made the presentation speech. The gift was in the form of a plumbers' ladle made or solid silver suitably inscribed. It was a beautiful token of regard.

President Tierney and family left for Denver, Colo., last evening for the benefit of Mr. Tierney's health. The indisposition of Mr. Tierney has been the cause of sincere regret and solicitude on the part of his numberless friends who hope and trust that he will find restored health and vigor in the balmy air of the foothills.

Mr. J. P. McCann, of New York, traveling passenger agent of the Missouri Pacific railroad, was one of the few men who accompanied the ladies on their ride yesterday. He is a host in himself and was very zealous in his efforts to make the trip of the ladies enjoyable from every standpoint.

Thos. P. Watts, of Louisville, Ky., has discovered since he struck the State that he is related to Governor Dockery and Senator McDonald. It is needless to say that he has been living on the fat of the land ever since. He is an enthusiastic Elk, and modestly subscribes himself "Best Plumber on Earth."

Stop it, ladies! The young gentlemen who represent the Glauber Manufacturing Co., are worrying themselves to the point of nervous prostration because they can't give you all of those little hatchets you want. One at a time, please; and if there are any left over after everyone has had one, you shall have another and yet another till they're gone.

The Lawrence Gas Fixture Mfg. Co., of Philadelphia, were unfortunate in having to take a room at the extreme end of the corridor, but they had a pleasant little surprise in the shape of a miniature "fixture" which kept the visitors coming in a pretty steady stream. It was great, and one victim was only too anxious to steer another victim up against it.

Mrs. Hornbrook desires us to announce that if any of the visiting ladies failed to receive an invitation to her informal reception on Thursday morning, it was by an oversight, and they will please consider themselves invited. Join the ladies at Baltimore and 12th, one-half block south enir on your vest in any case.

The Glauber Brass Mfg. Co., of Cleveland, are well represented at the Convention, Messrs. I. N. Glauber, A. H. Cline, Jr., and A. M. Buckman being here to do the honors of the occasion. They have a stunning souvenir up their sleeve which they will spring in due season. Don't miss it. Headquarters, room 232, Midland hotel.

The Instantaneous Water Heater Company, of Chicago, will demonstrate the operation of their Douglas, Acme and Flush heaters in room 120 of the Baltimore. These heaters have a safety locking device which is very unique in its operation and the delegates will find this an interesting exhibition. Messrs. Eisner and Fabian are in charge.

To Mr. Chas. Addison Hartwell, of New Orleans, are due the congratulations of his friends. He will go from Kansas City to Chicago, where he is to be united in marriage to Miss Effie McGuire, at 10 o'clock in the morning of June 19, at St. Vincent's Church. Miss McGuire is the daughter of a prominent Chicago manufacturer and one of Chicago's belles.

The International Heater Co., of Utica, N. Y., have had one of their heaters set up in Room 121 of the Baltimore hotel, and so illumined on the inside as to give one a very good idea of its working parts. It is in charge of Messrs. D. E. McCabe and Stewart W. Jameson, who will be glad to

show you the working of their heater, of which they are very proud.

T. F. Hanley, one of the Chicago delegates, is of the firm of Hanley & Casey Co., which has just completed the plumbing work at the Pan-American Exposition. The work cost $84,000, and was accepted as perfectly satisfactory. It was the largest order for plumbing goods ever placed, including 1,400 standard cast-iron seat-action enameled water closets, 600 lavatories and 1,800 lineal feet of slate urinal trough.

To Messrs. E. G. Hornbrook and W. H. Dow, of the entertainment committee, are due especial thanks for their faithful attention to those minor details which go so far to make the entertainment committee's work a success. They have performed much of what might be called the drudgery of entertainment, working early and late to keep the machinery well oiled. Their work has not been conspicuous, but it has been most effective, and they are deserving of much credit.

Milwaukee delegation, with a few delegates from the rest of the State, will make headquarters at the Midland Hotel. The genial president of the State Association, Frank P. Dengel, of Milwaukee, is accompanied by his wife. The register shows the delegates as follows: Chas. Polacheck, Hugo Lippert, E. Graessler, E. Dillman, W. H. Halsey, C. W. McNally, Aug. Rheins, Phil. H. Murphy, Jacob Schuh, Jno. R. Williams, Jno. A. Stemper, E. F. Aenoch, W. S. Patterson & Son, of Appleton.

Indiana sent in a solid delegation in a special sleeper which left Indianapolis Sunday night. It is made up of Messrs. H. H. Highland, Jno. R. Retherford, and Ira Jones, of Muncie; R. P. Whistler, of Marion; W. H. Powell, of Anderson; Emmet Martin, of Ft. Wayne; E. W. Craighead, of Richmond; Jas. Aslin and Thos. Williams, of South Bend, and Chas. Meikles, W. W. Wilcox, Geo. Kirkhoff, P. J. Freaney, J. W. Marshall, Chas. Anashaensel, and Jas. M. Healy, of Indianapolis.

The Chicago House Wrecking Company, and its method of doing business with the consumer, is attracting considerable attention among the delegates. The demoralizing effect of such methods is keenly felt by those who are aware of the fact that hundreds of catalogues advertising plumbing supplies are scattered among consumers all over the United States, in which all classes of plumbing goods are advertised at net prices, and sold to any person who will write an order or pay the money.

The surprise is now ready to spring. The Glauber Brass Mfg. Co.'s souvenir, mysterious whisperings about which have for several days been passed about among the initiated, is now ready for distribution. It is a miniature hatchet of the Carrie Nation type, handsomely nickel-plated, and bearing on one side the words "N. A. M. P., Kansas City, 1901," and on the other the name of the firm. All of the ladies who have caught surreptitious glimpses of it have been delighted, and if you don't secure one for your lady there will be trouble for you.

If any man dares to desert the big show till the last band has stopped playing, he will be counted a dead one and relegated to the realms of oblivion. This remark applies particularly to the great show at Fairmount Park to-morrow. Never mind about that business which is waiting for you at home. You'll get back to it all too soon. But if you leave Kansas City before you take in the picnic at the park, your name will be stricken from the list and you will be cut off from the fellowship of the faithful forevermore. The men who have wives and sisters with them are free from the temptation to run away, for they know that the couldn't budge the ladies from the spot with seventeen span of horses.

Chicago's delegation is stopping at the Savoy Hotel and is a strong one. Sam Smith, ex-secretary of Chicago local, is present in the interest of a fitting which he has recently patented. Following is a list of the delegates registered at the Savoy: J. B. Ryan, Jno. G. Roland, A. W. Wills, Jacob Adler, Jas. C. Boyd, J. W. Brunt, Jno. L. Corcoran, A. Jones, Jas. J. Wade, N. P. Molter, Jos. Schener, Dan'l Rock, J. A. Denniston, L. R. Bain, Jas. Reilly, J. W. Brown, W. F. Knause, D. J. Hickey, Chas. C. Breyer and wife, C. J. Boyd, C. T. Byrne, T. C. Boyd, Paterick Sanders.

The Chicago delegation was accompanied by Chas. W. O'Neill, of Peoria, and Messrs. J. W. Dougherty and Wm. Wilson, of Ottawa.

The New York delegation had a long but by no means tedious journey on their way to the convention city. The special club car of the B. & O., which was attached to their train was outfitted by Commodore Donahue, and was a rallying place for the forty delegates who left the greater city on Friday evening last accompanied by the Washington, Wilmington and Baltimore delegations. The monotony of travel was broken by a four-hour layover at Indianapolis and by a hearty welcome from the St. Louis association, the members of which had learned of the passing of the New Yorkers through their city and planned a hold-up. The delegates were taken from their train in a body, escorted about the city, and entertained right royally. They were taken on a trollev ride all over the city, visited the Shaw Botanical Gardens, and the Anheuser-Busch brewery, the management of which, though it was shut down for Sunday, started the machinery going, so that the delegates had a chance to see the big plant in operation.

Mrs. Hornbrook's informal reception to the ladies was the subject of much enthusiastic comment at luncheon. Your representative was unable to be present, much to his regret; but if he knows how to interpret the adjectives, "dearest," "sweetest," "loveliest," etc., as applied to a home, and "splendid," "fine," "most delightful," etc., as applied to a "time," he should say that the ladies considered Mrs. Hornbrook's home an ideal one, and Mrs. Hornbrook's mode of entertaining as thoroughly enjoyable The ladies of the New York delegation made a special request that we thank Mrs. Hornbrook for them through the columns of Domestic Engineering, and gave us carte blanche in the use of adjectives expressive of their appreciation. As Mrs. Hornbrook is as modest and retiring as she is gracious, we spare the adjectives, but wish to assure her that she has won an enviable place in the hearts of her guests, and the respect and esteem and gratitude of all who have watched her untiring, efforts for the comfort and entertainment of the visiting ladies.

The entertainment committee desire us to urge upon the delegates that they make themselves familiar with the program and plan to be at the place appointed for them at the appointed time. The committee has spared neither money nor pains in their desire to make the stay of the delegates thoroughly enjoyable. It will be next to impossible for delegates to spend any money in Kansas City if they follow the plans of the reception committee, since everything has been bought up and paid for in advance. If the delegates desire to cross the river and go over into prohibition Kansas, they will find that the conductor will refuse their fare if he sees their badge. Their fare has already been paid by the man at the gate. And so down the whole line. Even the shooting-gallery at the park has been bought off and an offer to pay will be a signal for the grand bouncer. The town is yours, as the acting mayor said, only you owe it to the committee to be present at every function which they have prepared for you and enjoy the good things they have paid for. Don't go wandering off alone. The fun is all with the crowd and you won't make any mistake if you follow the procession. Let the committee see that you appreciate what has been done for you.

Lavender and pink are the colors chosen as the official colors of the plumbers' ladies, and they were the colors which prevailed in the decorations at Emery, Bird, Thayer & Co.'s Tea Room, which the entertainment committee had reserved for Thursday afternoon, and where a delicate luncheon was served to about one hundred and forty ladies. At each plate was placed a beautiful pink peony, to which was attached by a lavender ribbon a card inscribed with a wish for, or a compliment to the guest. The same color effect was carried out even in the dainties set before the ladies, as will be seen by the accompanying

MENU.

Strawberries with Hulls
Iced Bouillon
Wafers New Peas
Spring Lamb, Mint Sauce
New Peas New Potatoes
Red Raspberry Punch
Tomato Salad Toasted Wafers
Ice Cream, M. P.
Pink and Lavendar Cake
After Dinner Coffee.

It is to be regretted that lack of space, the bane of the newspaper man's existence, forbids publishing a list of the ladies who graced the occasion with their presence. The ladies of the committee wish to thank the management of Emery, Bird, Thayer & Co. for the uniform courtesy shown to the committee and to the guests, and for the carefulness with which their plans were followed out to the last detail.

T. F. Davidson is an American merchant who went to the Hawaiian islands about ten years ago and started in business in Honolulu. He was at the Midland yesterday. During his residence on these new island possessions of the United States Hawaii has had a monarchical, provisional, republican and territorial form of government, and in consequence is in a state of political disruption that it will take years to overcome. Mr. Davidson says the Kanakas, or natives, outnumber the Americans and Europeans, two to one, and practically control the legislature. "In themselves, they are incapable of running the government, and during the last legislature accomplished absolutely nothing," he said. "They wanted an extra session and Governor Dole placed his veto on it. This is the sum and substance of the complaints against the governor." Mr. Davidson says the labor question is a serious one on the islands. Japanese and Chinese laborers are leaving the islands as their contracts expire, and under the United States law further yellow immigration is prohibited. Mr. Davidson says the 2,000 Porto Ricans recently imported are inadequate in numbers to harvest the crops. Regarding the civil service, he said: "A

special congressional enactment will have to be passed for Hawaii because it costs twice as much to live there as in the United States. Formerly the average salary paid government clerks was $100 a month. Complying with the Unitel States civil service laws this is reduced to $60 approximately. Efficient men cannot be secured at such a salary when they can get from $75 to $100 in the mercantile houses." Mr. Davidson is a metal manufacturer and has come 4,100 miles to attend the convention of plumbers in Kansas City.

An elaborate display of trade literature was made in the lobby of the Hotel Baltimore by "Domestic Engineering," acting for such of its customers as accepted its invitation to distribute printed matter for those who were not personally represented. Among these firms were:

The S. J. Asbell Co., Paterson, N. J. Card showing their frost proof hopper valve.

N. O. Nelson Mfg. Co., St. Louis, Mo. Blotter showing Nelson's ventilated latrines.

W. E. Peters, 3404 Roberts St., Kansas City, Mo. Circular showing the "Neverleak" cement.

The Calorific Heater Co., Easton, Pa. Card describing the "Calorific steam and hot water heaters.

The Atlas Pipe Wrench Co., 121 Liberty St., New York. Gave away a handsome souvenir matchbox.

Blake & Andros, Boston, Mass. Circular describing the "B. & A." combination union elbow valve.

The Beaton & Corbin Mfg. Co., of Southington, Conn., card showing the Beaton ceiling and floor plates.

The J. B. Campbell Brass Works, of Erie, Pa. Circular showing their brass goods for water and gas.

The Union Brass Works, 11 Hawkins St., Boston, Mass. Circular showing the "Soderlund" twin faucet.

The Wisconsin Graphite Co., of Pittsburg, makers of graphite pipe joint paste. Circulars showing prices.

L. T. Foreman and G. E. Beck, 440 N. 24th St., Omaha, Neb. Circular showing their swinging hose bracket.

Heeney & Smith, 705 E. 63d. St., Chicago. Circular showing the "Simplicity" trap-vent and revent filling.

The Garnett Valve Co., 313, 175 Dear born St., Chicago. Circular showing the Garnett automatic basin cock.

The Health & Comfort Supply Manufacturing Co., Cincinnati, O. Catalogue describing the "Eagle" water still.

The Davis Acetylene Co., 46-48 South Clinton St., Chicago. Circular showing the Davis carbide feed acetylene gas plant.

The Hart-Ayres Plumbing Co., Fourth Ave. and Degraw St., Brooklyn, N. Y. Circular showing the "Ayres" fresh air inlet.

Lamb & Ritchie, of Cambridgeport, Mass., (also represented by Geo. Nash). Circulars describing the L. & R. tin-lined iron pipe.

The Reading Stove Works, Orr, Painter & Co., Reading, Pa. Circular describing the "Sunshine" and "Triumph" steam and hot water heaters.

The Niagara Falls Acetylene Gas Machine Co., Niagara Falls, N. Y. Circular showing acetylene apparatus made under the Carter-Bell patents.

Lord and Burnham, of Irvington-on-Hudson, N. Y., manufacturers of steam and hot water heating boilers. Circulars Booklet on "Hot Water."

The Western Tube Co., Kewanee, Ill. Circular showing the "Kewanee" combination brass and iron ground ball joint boiler coupling for iron pipe.

The Abner Acetylene Gas Co., 34-36 La Salle St., Chicago. A series of five photographs showing the Abner giant generator and work done by it.

Geo. F. Ryan & Co., 3811 Cottage Grove Avenue, Chicago, makers of the "Chicago Hygiene Combination Sewer Connection and Clean Out." Circular: its construction and purpose.

The Instantaneous Water Heating Co., Chicago, makers of the Douglas, Acme and Flush instantaneous heaters. (Also represented by Messrs. Eisner and Fabian). describing their teaters.

William M. Crane Co., New York City. Embossed Catalogue of the Vulcan gas stoves, cut out like a stove shape, and a photogravure card of a handsome young housewife using the stove in cookery.

Kansas State Convention.

The members of the Kansas State Association met in convention on the Kansas side of the river on Monday, June 3, and proceeded to transact business at a rate which would astonish plumbers from some of the older States who pride themselves on their skill at turning out business in short order. In fact there was small time for loitering for every man Jack of the delegates was anxious to get through with the necessary routine and get into the bigger show in the big tent across the river. The roll call showed something over half of the seventy odd members of the State Association present and enthusiasm and good fellowship were very much in evidence.

Secretary A. P. Elder's report gave every cause for encouragement, for it showed the State Association to be in prime condition, having every eligible plumber in the state on its roll of membership with the exception of two or three who, it is hoped, will soon find their way into the fold.

The most significant event of the convention was the election of officers. With one exception the choice of the convention was for the men who have hitherto served the association so well. A new vice-president was elected, not because the convention did not appreciate John Sheahan, of Topeka, but because some modest Topeka man thought that his city had had her share of honor and so nominated a good man from a smaller place, H. A. Fairchild, of Hiawatha.

Following are the men who will take up the responsibilities of office for another year:

President, Chris. States. Topeka.
Vice-President, H. A. Fairchild, Hiawatha.
Secretary, A. P. Elder, Ottawa.
Treasurer. F. H. Bowers, Emporia.
Sergeant-at-Arms, C. M. Brown, Kansas City, Kansas.

President States promises to be greater than the president of the United States, since the State Association has now elected him for five terms hand running and seem very well contented with their choice.

Secretary Elder is a thorough going business man and has put the affairs of the State Association into good shape by his strict attention to business. He enters upon his fourth term of office.

The auditing committee is composed of the following gentlemen: J. H. Beasley, G. C. Hargreaves, and G. H. Bennett.

The association has had a troublesome law-suit on its hand for several years past and the treasury has suffered from the constant drain, but the officers are confident that they will win in the long run as they have both justice and reason on their side.

The officers have kept in such constant communication with the individual that aside from the routine work there were few matters to come up before the convention, and those which did come up were disposed of with the utmost dispatch and to the satisfaction of all.

The convention chose for its official representatives at the National Convention Messrs. F. P. Edson, Carl Graeber and Jno. Bishop, who will doubtless be heard from in their official capacity, but the members to a man declared their intention of being present at the deliberations of the national body if they had to bribe the door-keeper. Their enthusiasm is commendable and it is to be hoped that the powers that be will let as many of 'em in as possible.

Following is a partial list of those in attendance:

Arkansas City.—William Rowan.
Dodge City.—G. S. Patter.
Emporia.—F. H. Bowers.
Eureka.—J. W. Morton.
Fort Scott.—H. Ingman.
Hiawatha.—H. A. Fairchild.
Holton.—T. J. Bennett.
Iola.—Ira E. Patterson, W. H. Root, A. E. Balliet.
Junction City.—F. F. Ziegler.
Kansas City, Kas.—Geo. E. Hargraves, C. M. Brown, B. F. Engler, A. J. Myers, Ed. Draper.
Lawrence.—Carl Graeber, J. A. Benson.
Leavenworth.—Harry Caldron.
Manhattan.—A. N. Ziegler.
McPherson.—Gus Falk.
Newton.—G. R. Follett, Geo. E. Hollenger.
Pittsburg.—Ambrose Shout, H. Beasler.
Salina.—Jno. Bishop.
Topeka.—H. & P. Moon, Frank P. Olson, C. States, E. A. Chaney, J. K. White.
Wellington.—G. H. Crouse.
Wichita.—J. Green, C. A. Preston.
Winfield.—W. D. Winfield.

Ventilation vs. Non-Ventilation, as Applied to Plumbing and Household Sanitation.

An essay read by John L. E. Firmin, of San Francisco, Cal., on Tuesday, June 4, before the National Association of Master Plumbers.

"It is held as a fundamental principle in science, that every opinion before it is admitted as true and taught to others, shall first be established by proper proofs, which must not run counter to established truths, such for instance, that twice two are four and not five. Inference and conclusions which are opposed to such truths are rejected by science."—Liebig.

The above quotation from the great German scientist is used by Mr. Putman, of Boston, as a preface to a course of lectures delivered by that gentleman upon the subject of Plumbing and Household Sanitation.

Upon reading the above quotation and considering its application by Mr. Putnam, one is led to believe he intended to make its sentiments the guiding principle and basis of his investigations and discourse. In a paper of this character one is quite unable to do justice to a subject which on the contrary side, has enjoyed the privilege of such full expression as may be had in a long course of lectures; therefore, I shall endeavor to confine myself to certain

of the more striking features to which I cannot bring myself to agree.

I would here again refer to the above quotation of Leibig, and state that I have endeavored at all times to keep it in view. This confirms me in my belief that Mr. Putnam is not at all times logical, and that often, quite often, he allows his mind to become elastic, and to make things fit, endeavoring to demonstrate that two and and three make four.

First, the gentleman does not appear to have approached the subject in a scientific temperament; there undoubtedly is a strong sentiment of bias; evidently he places but little value upon the practical experience and researches of the plumber, while on the other hand, great weight is bestowed upon laboratory experiments and the opinion of Sanitary Engineers or any other party who may be classed as professional.

The true scientist does not overlook nor underestimate the humblest source of knowledge. Upon reflection it appears that the first error into which the gentleman has fallen is the hypothesis that the public sewers of the streets are, as undoubtedly they should be, scientifically planned, constructed and maintained; but as a matter of fact they are not. In the whole United States, we may assert, that there is not a single comprehensive system of sewerage and drainage at all meeting the requirements of the science of Sanitary Engineering, and we doubt if there is such a system existing anywhere; unfortunately, there appears to be little prospect of any great betterment in the near future.

In affairs of this nature the world moves slowly. For the moment let us refer to Boston; the matter of proper sewerage and drainage of her beautiful, wide, residence streets is a fairly simple problem, but to properly provide for her older portion, with its narrow, crooked, diverging, converging streets, where every other house is a century or more old, has a history and displays that fact upon tablets, quite another problem is presented. When we couple the physical to the sentimental features involved we have a task indeed, and one which can only be scientifically solved by applying such heroic remedies as, for instance, have been applied to Glasgow and New York, this is, blow up, tear down, remove; but I take it, Boston is in no mood to perform this task.

Now let us cross the continent to San Francisco. To her shame, San Francisco cannot point to one solitary street sewer which even approaches a condition of the requirements of scinece as applied to sewerage and drainage. Zola, the eminent Frenchman, in writing upon the city of Paris, says: "That house of the Rue des Saules, that horrible home of want and agony, had lingered in Pierre's memory. To him it was like an embodiment of the whole filthy "cloaca" in which poor Paris suffers want and death. And, on returning hither that afternoon he found the same slimy mud around it; its yards littered with the same filth; its dark, damp stairways redolent with the same stench of neglect and poverty as before. In winter time while the fine central districts of Paris are dried and cleansed, the far-away districts of the poor remain gloomy and miry beneath the everlasting tramp of the wretched ones who dwell there."

Now, when we know that these are the prevailing conditions, how unwise in us to base our investigations and deductions upon other conditions utterly at variance with existing facts. At first, in these lectures, we are led to suppose that they are to be largely the result of original research, but, as we proceed, we discover that as a fact, they greatly consist of a compilation, a concoction of what may be termed second hand, original investigation, and, to such a length is this carried, that to avoid being lost in the labyrinth of side issues and terms, one has to continually bring onesself not to overlook the main features, as it were, to prevent being hypnotized by a stream of ultra science. Science has fairly well demonstated that there are two general classes of bacteria, friendly and unfriendly, and that, as applied to sewerage and drainage, light and air cultivate and encourage our friends, per contra, are hard upon our enemies. This truth you fully accept and state, and, again and again, running all through your lectures you refer to the value of ventilation.

You state "It may seem strange, and at first thought, a trifling matter to insist on the abandonment of such small cesspools as pan closet receivers, grease traps, pot traps and small unscoured dead ends of every kind in our sewerage and plumbing system, but when we remember that in large cities and towns these little cesspools must be multiplied by thousands and hundreds of thousands, we see in the aggregate of putrefaction generated in them all and when emptied into the sewers, gives to our enemies, the dangerous class of bacteria, a very considerable equipment for harm," etc. Previously you have informed us that "It has been shown that the air of sewers does not contain disease germs, and is freer from all forms of bacteria than the outer air above them, and that in a well ventilated sewer the ai is innocuous" and that consequently "clealy the main house-trap and its vent becomes useless, so that the soil pipe may serve as an additional means of ventilating the sewer."

Now, if the air of the ordinary sewer is purer than the general surrounding atmosphere, how can it be rendered still purer by ventilation through the soil pipe vent? Do we understand it that the air of the sewer being purer than the surrounding atmosphere, logically, it must follow that the source of impurity must be looked for in this surrounding atmosphere and not in the sewer? During your lectures you place great stress upon the reliability of water as a seal and cut-off against sewer gases, which feature, practically, we accept as proven, and you state "that a sound and permanent water seal is a reliable barrier," etc., yet you would debar its use as applied to the main intercepting trap, only to contradict yourself when you state, "and with these old sewers and all modern ones resembling them, the main house-trap may in some cases be used very properly." Now don't we know that, as a matter of fact, practically all our sewers are of this imperfect character?

We are fully aware of all the objections which may be offered against the main trap, but experience has not proven these objections sufficiently supported to the extent of counter-balancing its good qualities.

A source of filth disease is a source of filth disease verying only in degree, and it is not necessary to multiply dead ends, pot traps, etc., by the hundreds of thousands in order to create unhealthy conditions. A ship at sea often is rendered the source of disease arising from unsanitary conditions and practices. While on the one hand you point ont the accumulation of filth, you broadly state that under modern plumbing practices this accumulation must exist and cannot be removed. We deny these assertions, and we do not accept your interpretation of what we may deem correct methods.

Speaking of dead ends: Granting that your theory of a displacement of gases and the ventilation of pipes through the vortex of a given discharge is correct, which we deny, then why not apply your theory to this entire system?

The experience of hundreds of men, covering a long series of years, is that your system is practically a dead system and, pardon us, we believe, soon, will prove a dead issue also.

You give examples of dangerous discharges from the top of stacks and refer to our enormous 100-feet lengths of pipe, with their vent, etc., and all their foulness, and that we would place an intercepting main-trap to guard against the danger of the innocent little 13 feet clean, branch sewer; now don't you see that 'tis not the 13 feet we would guard against but the elongated, large area cesspool of the public sewer, which we would contend with.

Undoubtedly the public sewer, bad as it may be, should be ventilatel, but not by bringing its intensified gases under our doors and windows and premises. Sometimes we prove too much; you mention experiments made to demonstrate the value of water as a seal, and in this experiment a very filthy trap and pan closet is used, demonstrating a given amount of poisonous bacteria, etc., then a brand new trap pipe, etc., is used, the result being nearly identical. This being a fact, then it would largely prove us all to be at sea.

Among other expermients you refer to an example where a mere pin hole in a pipe permitted the escape of countless thousands of deadly bacteria, and you also refer to the rapid decomposition of pipes where they are foul and unventilated. which we know, and we also know that practically, your system creates dead ends which lack ventilation and will decompose, creating not alone one pin-hole, but a series of all sizes and degree.

Your plan of providing air at main stack is not adequate to prevent back pressure under all conditions, again, since under your plan you would increase the movement of air through soil pipe limited ventage, what is to prevent the evaporation of your soil pipe trap's seal at the same general ratio you claim for other fixture vents? All else being equal, like produces like.

If, as you claim, the germs of disease cannot exert themselves when moistened or in a damp atmosphere and "never are given off to the surrounding air through evaporation of a liquor containing them, nor from thoroughly moistened sand or solid matter of any kind," then how do they exert themselves? The laboratory of nature is never idle, and we have many lessons yet to learn.

You say, "that which will destroy metal pipes will also be injurious to the delicate tissue of the lungs, and that it is certain that our safety is in proportion to the amount of dilution of dangerous gases by fresh air," again, "the danger from inhaling sewer gas is in proportion to its concentration and poisonous composition," certainly, and we would prevent gases of this nature being brought into our premises.

The definite thing to consider is, are the public sewers as now generally existing, generators of dangerous gases? Of course we fully recognize that primarily, in themselves, they do not give birth to offensive matter, but are they the active source of evil? We contend that they are; you appear to contend otherwise, and that the modern system of plumbing is the source of evil. In your arrangement or system you reverse the ordinary practice and remove your traps to a considerable distance

from the fixtures served and make one trap serve several fixtures, necessarily vastly increasing the area of waste pipe surface between the fixture outlet and the water seal. Do you contend that you are certain of an absolute cleansing of the surface of this additional inlet side waste pipe? If so, we contend otherwise, and you yourself state that an appreciable amount of bacteria may adhere to a surface seemingly clean.

We have no quarrel with you regarding your general views upon suitable proportions of pipes and fixture outlets, but we cannot accept such exaggerations as a basin plug less than ⅝ area when discussing a plan of modern plumbing. There is still plenty of room for improvement in these features, however.

Much as you may doubt it, there is a great deal besides "selfish interests and because it has become popular with the plumber and the pipe dealer, standing in the way of the exclusive adoption of your plan."

Moral and intellectual forces actuate the plumber fully as much as they may you sir.

Why in the example you offer of your simplified plan do you provide a U trap to your ice box? Surely not to provide against the admission of the general atmosphere of the apartment, nor can we well understand it, that it is a provision against your improved waste.

Often you round out your little theories by the addition here and there of this pipe or that pipe as "common accessions" you put it. Pardon us, you are apt to add whole systems to your examples of modern plumbing, which additions, as a matter of fact, have nothing whatever to do with the questions before us, namely, trapage and ventilation.

When one assumes the office of instructing us, the pupil believing the teacher is searching the truth and imparting it as he finds it, should be guarded by every precaution to prevent a misconception. For instance you give various elaborate examples of what you state are by us, considered excellent examples of modern plumbing, and which you designate "complication and insecurity," then other examples of your plans, marked "simplicity and security."

These examples are not honest however, in some instances they are theory run wild, in others, methods long since discarded; in others again, a novice, might easily become befogged.

You present some botches, which in addition to lack of intelligent arrangement, have absolutely nothing whatever to do with the system of wastage and ventage, facts you must be aware of.

Another peculiar feature of your examples; while on one hand you point out that on a ventage system, conditions require the plumber to do all sorts of manoeuvering to meet architectural requirements, you practicaly entirely ignore these conditions when demonstrating your own plan, and your pipes go as directly as the "crow flies."

Take your blue, red and black pencils and eliminate your wastes and vents from all other lines, and very much of the complication is gone, and, of what is left, we do not agree that as examples, they are what we advocate. In your experiments on vents, you have confined yourself to crown venting, or an approximate of that method, and state "that unprejudiced and well informed sanitarians now admit that special vent pipe is no longer recommended as a protection against siphonage. All admit, however, that the main stack of soil pipe should be thoroughly vented at head and foot." Why—may we ask?

You have satisfied yourself that ventage is worse than useless, that even when new, it does not prevent siphonage, but does dangerously increase the evaporation of water seal, then, you state all vents almost immediately become choked, closed up with deposit. Now, if this latter is the fact, which we claim is not the fact when properly arranged, how can a vent pipe which is choked up, also dangerously accelerate evaporation? Besides the same laws of evaporation apply to the soil stack.

In your experiments upon evaporation you present scales of loss of water seal, where crown venting, or an approach to crown venting is applied; you hint at one of the vital principles of venting when casually you state "and the evaporation gradually diminishes as the level of the water descends and the distance of its surface from the ventilating current increases," you admit that at a point six inches below crown that the evaporation is exceedingly slow, and practically is inappreciable," would it not have been well to follow this lead out? There is such a thing as "venting in the rough," and it is but slightly more expensive than is your plan.

It would appear that you greatly ignore the creation and action of gases within a system of pipes, and you would lead us to suppose that you have some superior method of adequately full bore flushing your plan, and that this method will absolutely cleanse your pipes. We assert you have nothing new, or superior in this regard to those methods which we enjoy, and that unler working conditions, it is entirely impossible to remove all particles of filth deposit.

If, as you contend, the law of gases is adequately provided for in your system of branches, why may you not apply this vortex principle of ventilation to the entire system? and for instance the elasticity and compressibility of air be relied upon.

We are not advocating the use of pot or any other special trap. Conditions and re-quirements greatly vary; we are acquainted with the good and bad feautres of traps generally, but you appear to give especial attention to the pot trap, and so various are your deductions that we are still somewhat at a loss to arrive at your true estimate.

Having assured us that dangerous bacteria cannot exert themselves under the moist conditions obtained in a pot trap, you then immediately point ont the danger of these miniature cesspools. Broadly speaking, we do not advise the use of any mechanical device which tends to retard the discharge of waste matter. We would rid ourselves at the earliest moment before active decomposition sets in.

Returning to your simplified plan, what, for instance, cleanses the branch waste serving your ice-box? Do you depend on the discharge from your wash trays? Well, our experience is that wash tray waste is at times liable to be both filthy and dangerous, especially when illness is in the household. However, it may be all right, considering an icebox only contains milk, butter, meat, etc. How nicely, innocently, you put it when you say, "The refrigerator and its pan should be raised above the floor enough to provide against backing up, and a small return bend may be used at the refrigerator outlet when conditions require it." What way these conditions be? Again you say "the waste of each fixture enters below the seal of the trap, thus preventing a return circulation of air from one fixture to another." Why this provision to prevent air circulating from one fixture to another, when you have assured us that the waste as you provide them are perfectly harmless? You tell us you have a trap, which, under your plan, may be relied on to meet all conditions and requirements. Then, again, under the head of back pressure, you refer to the 4-in. column seal of closets, and the lesser seal of other fixtures, etc. After having demonstarted that it is necessary to provide a water seal equal to a column 16" high to insure against back pressure, let us come back to your special trap, receiving two, three or more fixture wastes. Now suppose we exert the 16" column pressure against pour water seal. Is its volume sufficient to sustain the 16" column in all its branches, as, for instance, the bathtub and icebox, or do you depend upon the air area of your trap for safety? We are uncertain regarding these features. Do all the laws which may properly be applied to the outlet side of your trap fail of proper application upon the inlet side?

We may be wrong in our contentions, but we do contend that the basis of good plumbing, the foundation of household sanitation, is a well-planned and executed house drain and sewer. True, generally, they are either wholly or partly underground, but accepting your theory, danger from emanation of bacteria is very remote, while we assert that the fact of being out of sight demands of us all the greater attention.

You give another series of examples, none startling or new—in fact, they are quite innocent in comparison with many we might offer. But what strikes us as singular, after having stated you intended to systematically, scientifically, investigate plumbing and household sanitation, you immediately proceed to recite to us a series of lectures and entirely overlook this most vital feature of plumbing and household sanitation—namely, house sewers and drains.

We believe in light and ventilation, not only to the pipes themselves, but to the fixtures and the apartments in which they may be located—nay, farther, to the entire science of architecture—and we fully recognize that the noble art and science of architecture as a profession, suffers from charletanism and incompetents fully as much as does the art of plumbing.

Having touched upon the more prominent feautres of Mr. Putnam's lectures, I shall conclude with one or two quotations from that gentleman and then most respectfully submit to my fellow co-workers.

In the lectures we read "In well built and fairly well ventilated sewers, like the modern sewers of Paris, the air is perfectly safe to breathe, and these sewers are daily visited by travelers. All sewers should be constructed in this manner, but better ventilated, and the air within them being entirely innocuous, so far as disease germs are concerned, and, in all respects, safe in proportion to the extent and liberality of their ventilation." "Hence sewers can be constructed and ventilated in such a manner that the air within becomes innocuous." Precisely, so far, we thoroughly agree and farther, when these happy conditions prevail, then, and not till then, will we agree to make the household plumbing system a medium of sewer ventilation; and when this sanitary condition of the street sewers is obtained, we will still maintain that the same law of ventilation which assists to create this beneficial condition within street sewers shall also be applied and maintained by a wise and similar system of ventilation of the plumbing system proper. JOHN L. E. FIRMIN.

San Francisco, Cal., May 24, 1901.

Baltimore Resolutions.

Historically Reviewed and Fully Explained.

THE Baltimore resolutions—what are they? While all have heard of them, few appear to be thoroughly conversant with them. Not a few members believe them to cover everything, if one is to judge from the remarks to be heard here and there. Many manufacturers and dealers are in doubt on many points, and is it to be wondered at when ex-national officers have different ideas on several points, to say nothing of the conflicting opinions of state and local officers? After a most exhaustive reading of all the proceedings and carefully noting all the amendments, or interpretations as they are now styled, as well as the explanations and rulings of past presidents, backed by their executive committee, we are able to give a clear and absolutely correct (if published amendments and interpretations are to be relied upon) status of the protective resolutions of the National Association of Master Plumbers, as they are today.

Origin.

The Baltimore resolutions were named in honor of the city in which they were adopted, and not, as customary, after the author, otherwise they would have been called the Wade resolutions, they being written and introduced by J. J. Wade of Chicago, in a paper entitled "Protection to the Trade," at the second annual convention, held in Baltimore, Md., 1884. The original resolutions were intended to cover gas fixtures and material, and not until the seventh convention was the change made—striking out the clause relating thereto.

Revision.

In 1895 the convention revised the resolutions somewhat by striking out three of the resolves and adding a new one, more acceptable, to cover the points in the resolves stricken out, but not changing their meaning in any way.

Filial Associations May Make Agreements.

Many associations, especially in the east, found it rather difficult to secure the approval of the wholesale trade to the resolutions, and the convention held at Deer Park, Md., after a long and animated discussion gave discretionary power to locals to make local agreements where it was found the national agreement would not answer, or could not be enforced, provided they were submitted to the executive committee and approved. This rule has been interpreted in two different ways, but it is very clear from the wording that it was intended to grant permission to take from, rather than add to, the resolutions. Under this permission locals allowed wholesalers in the east to sell to consumers, provided the commission was reserved for the plumber. In the west, members went further and induced wholesalers to sell to members only.

After complications had arisen from certain sections granting exemptions, it was found necessary to emphasize that part of the resolutions, notwithstanding they were very clear, that wholesalers had no right to sell to consumers in places where there were no plumbers. Attention was particularly called to the fact that mines were not privileged to purchase plumbing goods.

Power of the Executive Committee to Interpret.

One year after the adoption of the resolution, power was given to the executive committee to interpret them. This power, as a prominent manufacturer recently remarked, delegated unlimited power, even to making ex post facto laws, without even consulting or sometimes communicating the new rulings to the signers, and then reprimanded them for violating unwritten and unknown rules.

It was not the original intention in giving this power, that it should be used to enlarge or add to the resolutions, but to make exceptions where it was found conditions demanded. However, the words delegating the power are capable of two meanings, and the wholesalers in signing the document concede this power and are liable to have any interpretations or new conditions imposed and are bound to live up to them, inasmuch as they have agreed to it since 1885. This unlimited power has not been taken advantage of to any great extent by the officers, and where it has been exercised it has usually been in conceding points of advantage to the wholesalers.

Interchange or Sale of Goods Between Wholesalers.

So far-reaching were the resolutions at first that they prohibited manufacturers and dealers exchanging their respective wares; but at the St. Louis convention wholesalers were informed that the resolutions did not aim to prevent the interchange of patented or any other plumbing materials between manufacturers and dealers of such goods.

It will be noticed that the above reads so as not to allow a manufacturer or dealer in plumbing goods to exchange (or sell) goods with a manufacturer or dealer not engaged in manufacturing or wholesaling plumbing materials.

Wholesalers Not in Accord.

At the convention of 1897 it was ruled that manufacturers and dealers in accord with the Baltimore resolutions could not sell plumbing goods to manufacturers or dealers not in harmony with the Baltimore resolutions.

A Master Plumber.

At the Pittsburg convention the association interpreted the term master plumber as used in the Baltimore resolutions to mean one who had a shop and material visible to the public, and proper cards or documents notifying the public to that effect.

At the Washington convention it was further required that to be a master plumber one must qualify under state or local enactments where such were required. This was to exclude those who could not or did not pass an examination or secure a license where it was required.

A master plumber was further defined by the convention in 1895, by requiring that he should have an established place of business and represent the industry of plumbing; that is, proprietorship of a store, and dealing in plumbing goods and performing work for the general public. As President Meathe explained, this did not permit janitors of buildings or employes of concerns not mentioned in the exceptions, even with a so-called shop, but doing work for their employers only, to buy plumbing goods.

This was no more than a reiteration of the action of the Pittsburg convention, but was made a part of the resolutions, the action of the Pittsburg convention not being incorporated as a part of the resolutions.

No Security or Selling to a Third Party.

In 1891, Mr. Wade finding that the resolutions were being evaded, offered a resolution which was adopted; that manufacturers and dealers should be prohibited selling through a third party; that is, to a journeyman plumber and accept the owner's security.

This was not incorporated in the resolutions, according to the printed form, but President Doyle made the interpretation, that no wholesaler could accept as security an owner or builder, and that when security was required it must be secured outside of the owner or builder.

President Doyle also declared that no manufacturer or dealer could use a plumber as a dummy.

No Waiver Allowed.

To put a stop to the practice of a few master plumbers allowing their names to be used by manufacturer and wholesale dealers to sell goods to others than master plumbers, the wholesale trade was notified by President Meathe, and later by President Doyle on behalf of the convention, that it was a violation of the Baltimore resolutions to accept a plumber's waiver and on it sell to the consumer, though a commission be reserved for the plumber.

Master Plumbers as Inventors and Manufacturers.

At the ninth convention complaint was made that some of the more progressive master plumbers were manufacturing and selling their specialties, and thus acting in a dual capacity; and the convention made the following distinction: that regular master plumbers manufacturing or causing to be manufactured and selling their own inventions only, were not to be classed as wholesale dealers; but, should they, in addition to selling and manufacturing their own inventions, sell goods not of their own invention, they should be classed as wholesale dealers and unfair competitors; further, that master plumbers "selling or dealing in plumbers' supplies at wholesale and retail" were violating the Baltimore resolutions. The above does not appear in the printed resolutions, but has been quoted as applying thereto, and part of the ground is covered by a later resolve, as follows:

Members Not to be Wholesalers.

At the Philadelphia convention it was decided that no member should sell goods to consumers when they did not furnish the labor necessary to put them in place.

Dealers Not to Do Plumbing Work.

At the same time members were restricted in wholesaling goods wholesalers were instructed not to do plumbing work. Thus both branches of trade are to keep in their respective lines.

Net Prices and Lists.

At the eighth convention it was declared that the practice of manufacturers and dealers in issuing net price lists on plumbing goods was an outrageous innovation. This was not printed with the resolutions but rulings have been made in accordance with the principle.

At the eleventh convention it was ruled that no manufacturer or dealer, or their representatives should furnish net prices or any discounts from list prices to others than master plumbers.

Exceptions.

In 1895 the executive committee, acting on their right to interpret the resolu-

tions, approved certain exceptions made the previous year by President Finnerty, allowing wholesalers to sell to the "United States Government, state, county, and city institutions, Sailor's Snug Harbor, railroad, gas, water and electric light companies for such goods as were used in their respective lines of business," bath tubs, closets and general plumbing fixtures not being considered necessary by the association "for their respective lines of business." This, as President Meathe explained to the trade, did not permit employes or officers of such institutions and companies to buy material for private use.

During 1897 the exceptions were more rigidly defined by a ruling that railroad, gas, water and electric light companies should not buy such general plumbing goods as might be required in erecting buildings, but only goods for repairs where a plumber was regularly employed.

As to railroads, it was especially mentioned that they could only buy material for fitting up their cars, pumping stations along their lines and water tanks for supplying locomotives and similar work.

State, county and city institutions are not allowed, according to the last convention's ruling, to buy goods except where plumbers are permanently employed by such institutions and where contracts are not being given out or estimates for labor only.

SHIP BUILDING COMPANIES.

The executive committee, in 1896, made an exception to allow ship building companies to buy such goods as were actually used in ships in construction or repair work in ship yards, and not for repairs outside of the ship yard unless the repairs were of such a nature as to require special methods outside of the general plumbing line.

PORTABLE BATH TUBS.

During his term of office President Doyle, on behalf of the executive committee, decided that the sale of portable bath tubs complete, with hot water heaters, sold to consumers in places where there were no water or sewer connections, was not a violation of the Baltimore resolutions.

NOT EXCEPTED—GALVANIZED IRON PIPE.

Finding that galvanized iron pipe was being extensively used for plumbing purposes and sold to consumers, the Cleveland convention called attention to the fact that galvanized iron pipe and fittings and all brass work for same were plumbing goods when used for plumbing purposes and the sale of such material under the above conditions was a violation of the Baltimore resolutions.

The hardship imposed upon manufacturers in observing this rule is to ascertain when the galvanized iron pipe is to be used in plumbing work.

INSTANTANEOUS WATER HEATERS.

The convention in 1897 decided that instantaneous water heaters were plumbers' goods and the sale of same to others than master plumbers was a violation of the Baltimore resolutions.

BARBER SUPPLY HOUSES.

The attention of dealers has been especially called to the fact that barber supply houses are not excepted in the resolutions.

SELLING TO MEMBERS ONLY.

At New Orleans, in 1899, an amendment was adopted agreeing that the members of the association would, in the future, purchase supplies from those who sell only to members of the National Association of Master Plumbers or to manufacturers and jobbers in accord therewith.

ARBITRATION REACHED.

In the year 1900, at Baltimore, after a year's trial of the New Orleans amendment, and after hours of spirited discussion, the New York Conference Resolutions were adopted. After a trial of nearly a year they were amended, and at the present date stand as follows:

Whereas, We believe it would be to the best interests of the manufacturers, jobbers and plumbers of the United States, that the sale of plumbing goods be confined to master plumbers as herewith defined:

1. A master plumber is one who has an established place of business and represents the industry of plumbing, and who has qualified under state or local enactments regulating plumbing and plumbers where such exist; or, where no license is required, an individual or firm with an established place of business and representing the industry of plumbing.

2. Resolved, That we recommend the establishment of a Joint Standing Committee on Conciliation to which shall be referred all cases of dispute between the plumber and the dealer. This Committee shall be constituted by the appointment of six members, three of whom shall be named by the President of the National Association of Master Plumbers, and three by the Chairman of the National Committee of the Confederated Supply Associations. In case they cannot agree they shall submit the question to three arbitrators, chosen in the usual way.

3. That plumbing goods shall not be sold to dealers who do not confine their sales to master plumbers.

4. No material or labor shall be furnished to any building that is in default to any plumber or supply house, or where the completion of the work is delayed by a strike.

5. A manufacturer or dealer accepting a waiver of a master plumber giving permission to sell goods to a consumer, even if the commission is reserved for the plumber, is considered a violation of these resolutions.

6. Sales based on owner's or agent's guarantees or mechanic's liens are prohibited and are violations of these resolutions.

7. Manufacturers or dealers, or their representatives, in plumbing supplies, are instructed to refrain, either directly or indirectly, from estimating on any job or jobs, and the practice of taking off lists of fixtures from architect's plans and disseminating such information among the plumbing fraternity, shall be construed a violation of this article.

8. Supply houses, doing a plumbing supply business and contracting for plumbing work, directly or indirectly, are considered unjust competitors.

9. Net prices or any discounts from list prices furnished to others than those allowed to buy under these resolutions are violations thereof.

10. The practice of sending out net prices, even to master plumbers, without requests for same, is a violation of these resolutions.

11. Master plumbers shall not sell plumbing material when they do not install the same; nor shall they install plumbing material that they do not furnish. Master plumbers violating this Article shall lose their recognition as master plumbers as defined in Article 1.

12. The following are exempt from the operation of these resolutions: The United States government, state and county institutions, railroad, gas, water and electric light companies, only for such goods as are necessary for their respective lines of business.

Interpretation to Article 12.

United States Government and Its Various Departments:

May purchase plumbing goods for use in their buildings.

The above exemption does not permit contractors on government work to purchase plumbing goods unless said contractors are master plumbers as defined in Article 1.

State and County Authorities:

May purchase plumbing goods for all their institutions wherein plumbers are permanently employed.

Railroad Companies:

Are exempt for all goods used in their cars or for fitting up pumping stations or water tanks along their lines for the supply of water to locomotives.

Are permitted to buy pipe and fittings.

Gas and Water Companies:

Such exemption shall cover purchases for work on their lines only, and shall not be construed as authority to buy plumbing goods for use in any building.

Under these exemptions railroad, gas, water and electric light companies are not to buy plumbing goods for the erection of new buildings, or for the alteration of old buildings, but can buy for repairs where a plumber is permanently employed.

Car and Ship Builders:

May buy plumbing goods for use in their cars or ships, but not for plumbing in buildings.

Under these interpretations plumbing goods shall not be sold for use in the buildings of offices or employes of the governments or companies mentioned.

13. Local agreements in conflict with these national resolutions shall not be permitted.

14. The penalty for violation of these resolutions shall be left to the discretion of the arbitrators, and be commensurate with the violation and circumstances.

15. When a case comes before the national arbitration board the loser shall pay the costs of arbitration.

16. The Standing Committee on Conciliation shall be empowered to select one of their members as Treasurer and deposit with him all money collected on account of penalties imposed; and further, have the power to assess equal amounts on the two National Associations to cover their expenses.

17. Local investigation committees shall be appointed upon the request of the President or Chairman of either Association, and constituted as follows: One member shall be appointed by the President of the National Association of Master Plumbers, and one member by the Chairman of the National Committee of the Confederated Supply Associations, and shall make provisional report to the presiding officer of each Association.

18. The names of master plumbers entitled to buy plumbing materials shall be recorded by or in each city and town as agreed upon by the master plumbers and the dealers in or near said cities and towns. A list of said legitimate master plumbers shall be filed with the proper officers of each National Association. Additional names shall not be added to said list until agreed upon by the said master plumbers and the dealers in plumbing supplies. This clause shall not in any way be interpreted to interfere with the operation of Article 1, in which a master plumber is defined.

19. That any violation will be taken up and duly considered by the committee and proper action taken.

IN the smoking-room of the Pullman car on the way to Kansas City the "Old Timer" gave the scribe a vast amount of information in relation to previous conventions of master plumbers which he considered of sufficient interest to those of the later generation who are chronic convention goers, to put in type, so we shall make a feature in our daily issue of these memories of the "Old Timer." We do not pretend to be absolutely accurate but in general we think we have his remarks substantially correct.

As the smoke of his Carolina perfecto circled up toward the ceiling of the rapidly moving car, he said: "Whenever I think of the first convention, of what has now came to be such an important organization, my mind invariably runs back over the list of the 'old timers' who

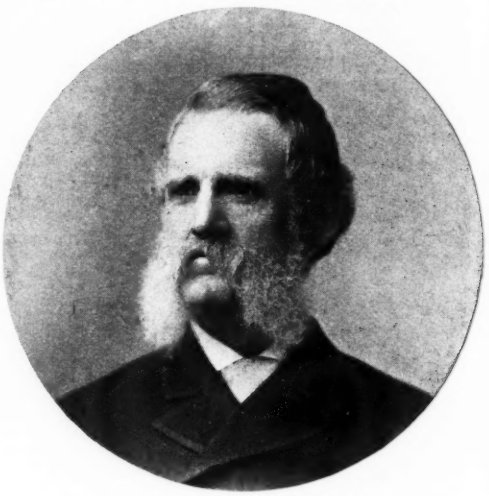
HENRY B. GABAY, of New York City.

have ceased attending national conventions. The movement which led to the first meeting originated in New York in 1882. The Master Plumbers' Association of that city had long felt the necessity of taking some united action against the abuse which had grown to be somewhat serious,—the outside public being able to purchase plumbing supplies at and below trade prices, from the manufacturers and dealers. On December 1 of that year a largely attended meeting of the association resolved itself into a committee of the whole and took up the subject of 'Protection to the Trade.' Gen. F. T. Locke was in the chair and I never remember seeing Gen. Locke at a meeting after the first one. A committee of ten was appointed at that meeting to devise measures to secure the desired protection, but this committee was subsequently discharged and a new committee of twenty-one, afterwards enlarging itself to twenty-five, was created, with T. J. Byrne as chairman.

"This committee met January 10 at the Astor House and elected officers and appointed special committees and invited the Brooklyn association to meet with them. They very speedily discovered that it would be necessary to ask the co-operation of the trade throughout the

THOS. H. RADCLIFFE, of Brooklyn, N. Y.

entire country and on January 25 a circular was sent out by the joint protection committees of the New York and Brooklyn associations, to all the trade of the United States. Mr. Byrne, as I have said, was chairman of the New York committee and Edward Murphy, for so many years one of the 'war horses' of the association, was secretary. Geo. Cummings was chairman of the Brooklyn committee, with W. C. O'Keefe secretary. It is a long time since Geo. Cummings attended a meeting, but I remember distinctly his conservative advice and dignified bearing. There were twenty-five names attached to the resolutions on behalf of the New York association and eleven on behalf of the Brooklyn association. Among those 'old timers' who signed on behalf of New York were Harkness Boyd, Cauldwell Fraser, N. G. Gerety, James Muir, Joseph A. Macdonald, of lamented memory, Abraham Mead, Michael Sexton, A. B. Sands and John Toumey. Among the names who have kept closely in touch with the association up to the present time are those of H. G. Gabay and John Mitchell. The Brooklyn association had among its signers J. W. Birkett, 'Gentleman Jim,' as he was called, who afterwards went into the supply business and died a number of years ago; Martin Falion, a member of the executive committee not many years ago; Mortimer J. Lyons, a man who had as strong a grip on the treasurer's office as long as he lived as our present revered Goodman; Geo. B. Lewis, always conservative,



GEN'L. GEO. D. SCOTT, of New York City.

and Thomas H. Radcliff, who at that time was quite a young man.

"Along in February another circular was issued on behalf of the New York and Brooklyn associations to the entire trade of the United States. And on March 7 a meeting was held by invitation, representatives from New York, Philadelphia, Brooklyn and Jersey City being present. This committee called the first national convention to meet in New York June 27, 1883, and I remember that Abraham Mead was the chairman of the committee that called this meeting and among the names was that of our old friend from Newark, Elias Berla, who has never lost interest in association matters.

"I shall never forget that first convention. It was in the Masonic Temple on Wednesday morning when Edward Murphy first rapped a national master plumbers' organization to order. Col. Scott made a motion that Abraham Mead should be temporary chairman and unconsciously that motion was the forerunner of much trouble.

"Enoch Remick, of Philadelphia, was one of the first secretaries and Edward Murphy, of New York, was the other.

"Another thing I do not want you to forget, my young friend, is that this association has always invoked the Divine blessing upon its labors and I think it is a mighty fine thing for an organization of business men to open their proceedings in this manner. The first convention was not opened by prayer by a clergyman but I distinctly recollect Mr. Mead's invocation for the superintending care of the Father of all mercies. Mr. Mead was a good man and I for one sincerely regretted the trouble which finally drove him from the fold of the National Association.

"Among the delegates to the first convention how well I remember Alex. Low, an impressive, earnest speaker with a large full voice who made people listen to him but who came to a sad end so far as association matters were concerned. Then from Brooklyn there was a well known man in Henry Hawkes. Chicago sent a lot of men who afterwards made

their mark upon association matters. The delegation included, Young, Wade, Hamblin, Griffith, Murray, Boyd and Moylan. It also included Thomas Kelly, who very soon after that began with his brothers to manufacture plumbing supplies and ceased to be a master plumber. It also included J. S. Bassett, who, I understand, was one of the oldest plumbers in Chicago and who never amounted to anything in association work. David Bain was also a delegate to that association, I remember now. Among all the faces I shall always remember that of the now aged Wm. E. Foster of Norfolk, Va.

MAJ. W. E. FOSTER, of Norfolk, Va.

"The last time I saw Col. Foster was last year on my way to the Baltimore Convention. The old gentleman has become practically blind, so that he cannot take an active part in association matters any longer, but I shall never forget his courteous manner, his dignity of address, and the affection which was always shown him by the other delegates.

"From Philadelphia came Geo. F. Uber, young then but also young now.

"There was also a strong, robust and vigorous man from Philadelphia whose name will always be remembered by the early association members and whose death was a great blow to the trade, John J. Weaver, who always stood for fair play and the right in every question. Another delegate was Jas. H. Lyons, a fine-looking man with commanding presence and dignified manners, who afterwards went into the Keystone Pottery and died several years ago. Other well known names in that Philadelphia delegation were Evenson, Mentzinger, Harkness and our always genial friend, McCoach.

"Baltimore had some good men, but among them I remember best Rothrock and Dunnett. And Hudson county, New Jersey, sent five men, of whom one, J. F. Blackshaw, has kept pretty well in touch with plumbing matters. Cincinnati sent a man who was afterwards to become president of the Association, James Allison, an urbane gentleman of great talent who has since become greatly interested in the reformation of delinquent children and who is now superintendent of the Cincinnati House of Refuge. In the Cincinnati delegation was Hugh McCullum, a Scotchman, who afterwards went into the lead pipe business. From Providence, R. I., the first delegation had two men who have been most prominent in association matters, our worthy president, Patrick Tierney, and his indefatigable secretary, James C. Conroy.

"The delegation from St. Louis contained three men, all long since passed beyond, Graham, Abel and Roden.

"From Boston I remember distinctly Jas. Tucker, Isaac Riley and Davlin, the orator.

"From the Northwest there was only one man, J. J. Dunnigan, whose appearance has always caused plenty of enthusiasm whenever he has attended a convention. From Johnstown, Pa., Jno. H. Waters, now a very prominent citizen of that state and prominently identified in the manufacture of steam and hot water radiators.

THE second convention went to Baltimore and many of us will remember the old Corinthian Hall in the Masonic Temple. It met on Wednesday morning and President Scott called the meeting to order and then the meeting adjourned to permit the committee on credentials to make its report. Mr. Boyd of Chicago had the honor of handing in the constitution and by-laws. Among the delegates at this convention is one who afterwards came to be exceedingly prominent, E. J. Hannan, of Washington. I shall never forget Mr. Boyd's stentorian voice when he read this constitution section by section and battled for its adoption. It was an all-day job and consumed all of Wednesday.

"Another delegate who was very much in evidence at Baltimore was Mr. Collins, of St. Louis, to whose valorous defense the writers of essays owed the opportunity to read them on the floor of the convention, a delegate from New York wanting to have them printed and not read. Those were good times when we used to have essays and we had them for a number of conventions, but they have gotten pretty nearly out of style now.

"Another Washington delegate who was always welcome whenever he attended a convention was the late Jas. Ragan. I remember seeing James at Baltimore last year when he came over with his post of veterans, not as a delegate, but he found a great many friends who welcomed him.

"A Boston name which afterwards came into prominence was that which appeared first on the rolls of this credential report, Mr. Finnerty. Another honorable man who always stood for clean methods and for right action and who appeared first at the Baltimore convention, was the late J. G. Weldon, of Pittsburg. I shall never cease to be grateful for Mr. Weldon's advocacy of clean things.

"It was at this convention that Mr. Graham, of St. Louis, made a report which created a great deal of interest. It was upon the relations between the local master plumbers' association and the jobbers, and among the names of the jobbers I find one firm that has absolutely passed out of memory, that of Chas. D. Wind & Co.

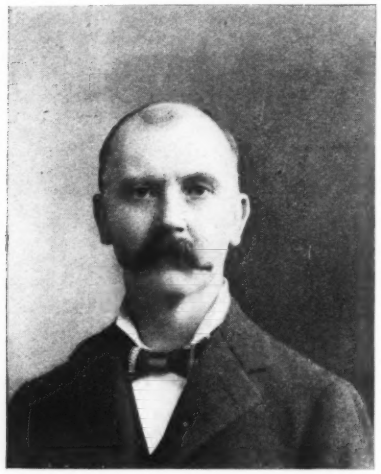
"It was at this convention that Mr. Mead took the action which finally landed him outside of the association fold, much to the regret of many friends who felt that his aid should have been retained for the benefit of the association.

DANIEL G. FINNERTY, Boston.

"It was at Baltimore that Mr. Wade performed a signal service to the entire plumbing trade of the country in presenting what afterwards came to be known as the Baltimore Resolutions, which, so long as they were adhered to, worked very satisfactorily with the entire plumbing trade of the country."

THE "Old Timer" took a fresh cigar and after it was lighted and about a quarter of an inch of ash on the end of it, he said, "Well, it was a stunning convention that met at St. Louis. Jeremiah Sheehan welcomed us to St. Louis. There was a whole lot of new people there because the local associations of the country had been growing. That was the first time I ever remember seeing P. J. Kane of Alton at a convention. There was a whole lot of other towns like Denver, Col., Leaven-

worth, Kans.; Des Moines, Ia.; Muscatine, Ia.; Madison, Wis., and Memphis, Tenn., represented. From Canton, O., came L. B. Cross. Lewis after this came to be very prominent in convention matters and hails now from the city to which we are going for this nineteenth convention.



W. G. Ashdown, Kansas City.

"It has always interested me greatly to study the complexion of delegations. Some men will come to the convention year after year, being re-elected as delegate without intermission. Our old friend, John Trainor, was not a delegate to the first convention but he was to the second and I think he has been present at every convention since. Certainly he is one of the most regular of all our veterans. But it is also true that some people are elected as delegates, then drop out and we do not hear very much from them afterwards. Then, too, it is interesting to watch the growth in delegations showing the growth of associations. In the first convention St. Louis had but three delegates, while in the third convention she had thirteen.

John Trainor, Baltimore.

"The question of licensing plumbers came up at this third convention for the first time and there was a very interesting discussion on this subject. I think the St. Louis convention was the banner convention for essays. The committee assigned thirty-six subjects at this convention and a large number of papers were presented.

"It was at this convention that the N. O. Nelson Mfg. Co. took all the delegates, traveling men, manufacturers, and newspaper men, down the river on the 'Dacotah,' and a most enjoyable excursion was had.

"It was also at this convention that the veteran supply dealer, Fred Adee of New York, came seeking the correction of the Baltimore resolutions so that they should not be supposed to interfere with the interchange of goods between manufacturers and jobbers, and he took back to New York what he came for. This was one of the longest conventions we ever had. As a rule conventions do not do much on Friday. This convention had a very long meeting on Friday.

"There are a good many people who do not think it worth while to take the association to a summer resort. But somehow or other I greatly enjoyed the fourth meeting. It was held at Deer Park, in Maryland."

The scribe here interfered in the flow of language which the "Old Timer" had been giving him, long enough to state that it was the hardest work to report that convention that he ever had because they were so far away from typewriters, stenographers, and from all other kind of help which newspapers require. The locality also interfered with the delegates as they only had 139 in attendance. The "Old Timer" went on, "I shall never forget the beauty of Deer Park. Do you remember the time we took that long walk over the mountains and through laurel bushes in full bloom and covered with mountain dew? I think that was

L. B. Cross, Kansas City.

one of the most enjoyable times I ever spent—that long walk we took over the hills far away. I never shall forget either our old friend, John Kelly of Chicago. He was particularly happy over the mountain dew which he found at Deer Park.

"You remember Ed. Futerer, that whole-hearted fellow from Columbus, O? Deer Park was the first place I remember of seeing him and I was quite pleased with the report he made at that time as state vice-president for his state. Poor boy, could not stand the pace and last long for convention uses or any other. It was a great pity. People will work themselves out in ways which do not yield any benefit to themselves or anyone else. It was at Deer Park that there was a battle of the giants over the Baltimore Resolutions. There were speeches by Young, Mitchell, Griffith, Davlin, Macdonald, Gallagher, Trainor, Gabay, Finnerty and others. But the resolutions stood all the battles for and against and have done pretty well for the trade up to recent times. I also remember that there was a distinguished visitor at Deer Park while we were there—Grover Cleveland, the president of the United States, being in residence at his cottage.

"It was at this convention also that T. C. Boyd of Chicago first moved that the convention adjourn without a day. Mr. Boyd, as I believe, has had the uninterrupted prerogative of making this motion ever since. And it would almost

John Byrns, New York.

seem that a convention could not be legally adjourned unless he made the motion.

BOSTON got the sixth convention and there were 217 delegates there. I remember well the figures. John Byrns was the president and a dignified president he made too. Of course, we had the silver tongued orator Davlin to welcome us. When all is said and done there never has been a better speaker than 'Jim' Davlin at any convention and it is a matter of a great deal of regret that we do not hear from him any more. It is worth noting that this Bosthe convention was the first one to which our strong friend, Ed. Hornbrook, of Kansas City, was elected a delegate.

Charles Polacheck, Milwaukee.

The other Kansas City delegates were also pretty well known people. They consisted of Capt. Goss, Dent Yates, and W. G. Ashdown, all of whom have been most prominent in association matters ever since. Among the other delegates I well remember John Carey, of Baltimore, and Daniel Shannon of Boston and our old friend, Robert Louden, of Bloomington, Ill., who has been a very steady

convention goer since. And in the Cincinnati quartet there was Steve Nolan. Great big hearted Steve; But the friends we form in convention times are well worth remembering. From Denver there came Frank H. Paradice, who has for a number of years been in the supply business. There was a delegate from Helena, Mont., Mr. O'Brien, an inventive Irishman, who has had some good things on the market but who has never struck luck with his manufacturing yet. And from Louisville there was Simon Shulhafer. Simon does not come to conventions any more, much to our loss, too. Milwaukee sent down Chas. Polacheck. Charles has been one of the most useful association men we have ever had. It is rather a curious thing that an association meeting at Boston with Providence so near that there should have been only one delegate, and that one not our own Mr. Tierney.

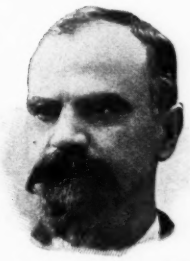
"It was at this convention that we had an address from the president of the Manufacturers' Association of iron and brass work, Arad T. Foster. And I think it would be a good thing if there could be closer relations between the manufacturers and jobbers on the one hand and the master plumbers on the other. We do not get near enough together.

THE Pittsburg convention, which was in 1889, if I am not mistaken, met in the building of the Standard Mfg. Co. on Wood street. I think that is the first time we have ever met in a private building. John Trainor was the president and John always made a good presiding officer. It did not take long to find out that the hall in which they were meeting was not suited for the purpose and the second session was held in another hall (I have forgotten the name of it) not very far away on the same street.

THE LATE HENRY EWINGER.

"It was at this convention that the Baltimore people made the gift of a gavel—a handsome ebony one bound with a silver band and suitably engraved.

"It was also at this convention that I remember seeing for the first time that honest old giant from the west, Henry Ewinger, a man whose heart was as big as his hand, and I think it was the largest hand I have ever seen. From Decatur, Ill., came a man who has since become very prominent in the trade, P. Mueller, of what is now came to be known as the H. Mueller Mfg. Co. In the Syracuse delegation I remember Ed. Joy, who has since got to be a jobber. Quite a number of people in our trade have gone upward and made themselves prominent in the wholesale trade and this is the way it should be, it seems to me. And I wonder why it is that our retail



COL. C. C. DEWSTOE, Cleveland, O.

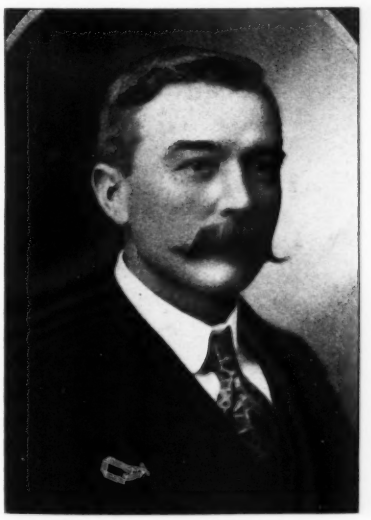
plumbers so nearly always allow the jobbing houses to be organized by people who have never been in the retail trade. Why should not our master plumbers gradually get to be wholesalers, as the highest notch?

"It was at this convention we had a most interesting incident which I recall very well. Wm. Tate, the pioneer plumber of Allegheny county, 84 years of age and whose apprenticeship indenture was dated in 1819, made a few remarks in which he said that he came from Yorkshire, Eng., landed in Baltimore and walked across the country from Baltimore to Allegheny county, where he had been located for 58 years. He was the first plumber in the place. It is a good idea to remember these things and to honor the old veteran plumbers who came from the old country and made the beginnings of the business in ours."

IT was a long trip we took when we went to Denver, where the convention of 1890 was held. A washout detained a train bringing a number of eastern delegates, so that it was impossible to get together Tuesday morning, but at 1 o'clock we marched to the convention hall and President Hannan, of Washington, and President Dolan, of Denver, marched side by side at the head of the procession. Denver will always be remembered for the excellent entertainment which was afforded the delegates. There was a ball and reception and theatre

PAUL REDIESKE, Chicago.

party for the ladies and a reception at the house of Mr. Joseph Creswell, and an excursion over the celebrated loop up into the Clear Creek Canon, and Saturday the party was taken through the Garden of the Gods at Manitou. The number of delegates at this convention was 181, which shows how difficult it is to get large numbers of people to go long distances away from home. The Buffalo contingent contained the jolly Chas. Geiger, who is such a feature in the plumbing business of the Exposition City, and Jacob Mensch. Jacob has closed up his plumbing shop, we understand, and is going into the hotel business during the summer months, and he and his brother will push their automatic heater as rapidly to the front as its merits deserve.



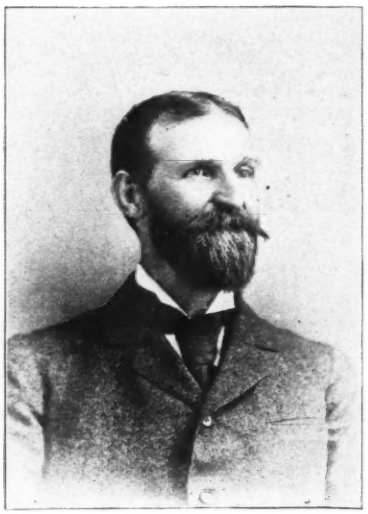
JNO. F. GEAREN, Sioux, City.

From Cleveland we had C. C. Dewstoe, the genial colonel, who is now postmaster in that thriving city. Mr. Dewstoe's conservative views have always been of use to the association. From Des Moines, Ia., came "Jock" Burnside, who drinks pepper in his water. There came to this convention a delegation from far away Portland, Ore., and it contained Alex. Muirhead, one of the levelest heads of the northwest. There was a new face from Sioux City, Ia., Jno. F. Gearan, who has, I learn, become of a good deal of use to association workers in the northwest. Among the names of delegates from St. Joseph, Mo., was M. E. Herbert. Mr. Herbert afterwards left that town and went to Chicago, where, I understand, he is doing a very large business in steam and hot water heating boilers.

I remember that at this convention President Hannan said a very good thing in his report, when he remarked that the plumbers should now turn their attention to the commercial features of their business, that they had not improved financially as much as they had advanced in other directions, and recommended the passage of state sanitary laws to prevent any but competent plumbers from engaging in the business. The banquet was another noble feature of the Denver convention, 400 seating themselves in a large room at the Windsor Hotel, Gov. Cooper making the speech of the evening.

Down in Cincinnati, over the Rhine, the convention held its meeting in 1891. I was there, with the rest of the boys, when President Griffith, Robert Griffith, of Chicago, called the meeting to order. Mr. Griffith used a gavel at this convention the handle of which was made from a piece of wood from the bottom of the South Fork Dam, which caused the great destruction of Johnstown, Pa., and the

head of the gavel came from Pike's Peak. The credential committee reported a very large meeting for that time, 202 delegates. Such towns as Altoona, Pa., Chattanooga, Tenn., Duluth, Minn., Evansville, Ft. Wayne and Indianapolis, Ind.,



CHARLES S. TURNER, Parkersburg, W. Va.

Nashville, Tenn., Seattle, Wash., Hamilton, O., Springfield, Mass., and Syracuse, N. Y., being represented. Indeed, this was a convention where small towns predominated.

Among the Chicago delegates was Paul Redieske, the monumental Lincoln Park superintendent. From Springfield, Mass., I remember J. W. Kennealy, who, one time when I visited that city, took me on a very pleasant trip in his wagon all over that beautiful town. From St. Paul, Minn., came W. J. Freaney, who is now one of the best plumbers in Indianapolis. From Indianapolis there came a good man in the person of Chas. Aneshaensel, who is a prominent member of the associations of Indianapolis and of Indiana. From Kansas came C. J. Prescott, of Topeka, a man who died while still young and while promising much to the plumbing interests of his city. From Nebraska came N. B. Hussey, of Omaha, who has since died and whose name has now passed out of the plumbing interests of that city. From Parkersburg, W. Va., came Chas. S. Turner, who has been mayor of his town and is an important factor in the business in his vicinity. From Toledo, well I remember Robert Raitz, an excellent plumber, whose store is one of the attractive features of the city.

It was here that Mr. Lyons, of Brooklyn, tried to reduce the number of members of the executive committee and thus reduce the expense, and by reducing the expense to reduce the per capita tax, and a strong fight was made for it, but it did not work. It was at this convention that Joe McDonald accepted the office of president, little thinking that he was not to live to complete the term of office. A feature of the Cincinnati convention was the fact that during the lull in the proceedings, the ladies, having entered the hall, several speeches were made to them, the speakers including Andrew Young, of Chicago, John Trainor, of Baltimore, and L. B. Cross, of Kansas City, Mr. Cross being introduced as the only bachelor in the hall, but Mr. Cross has since been married. Not only has he left the role of bachelor but he has left the plumbing business as well.

IN 1892 the association went to Washington, which was about as hot a place as could be selected at that time of the year. A number of delegates were stricken by illness. The credential committee's report showed 260 delegates, a very large increase over that of Denver. From Texas came Ed. Braden, Jr., who has since played such an important part in the national conventions. The St. Louis delegation was headed by Jeremiah Sheehan, who, I read in "Domestic Engineering" lately, has been made a member of the upper house of the city government, which is considered a great honor, especially as I understand that St. Louis is a republican city under normal conditions, and Mr. Sheehan was elected on the democratic ticket by a majority of about 5,000.

J. SHEEHAN, St. Louis.

The Milwaukee delegation was headed by W. H. Halsey, a man who has been very prominent in the plumbing circles of his city.

DENT YATES, Kansas City.

A pathetic thing about this Washington convention, as I remember, was the request of Wm. Smith, of San Francisco, inventor of the siphon jet closet, that the convention should endorse his application to congress for an extension of his patent. It is a great pity that such an important invention as the siphon jet closet should have yielded its inventor absolutely no benefit. T. C. Boyd heartily favored Mr. Smith's request and the association adopted the recommendation, but no good has ever come of it to Mr. Smith.

It was at this convention that the interpretation of the term "master plumber" was adopted, a master plumber being one who had qualified under the local or state laws where such existed. Indianapolis was selected as the place where the next convention should be held, Chicago and Atlantic City being the unsuccessful aspirants for the honor. In Washington every delegate was introduced to President Harrison, and the Marine band gave a promenade concert in the parlors of the Arlington Hotel. The Henry McShane Mfg. Co., of Baltimore, Md., extended to the convention a tally-ho ride and sail on the river to Mt. Vernon.

Indianapolis was not able to carry out its part of the contract and the eleventh annual convention went to the Hotel Pfister, at Milwaukee. A good time we had there, too. We always have a better time in a cool city than we do in a hot place. The report of the credential committee showed a good many new names. Among them was that of Bert Lambert, of Ypsilanti, Mich., now so well known as a manufacturer of plumbers' fires. The Louisville delegation was headed by W. H. Matlack, who has always been a conservative member of the local association. Bridgeport, Conn., had Zalmon Goodsell, another clear-headed, right-thinking plumber. Cleveland, O., sent in its delegation Louis Poplowsky, who has come to be a fixture at conventions. From Kansas City, I remember Geo. P. Kirtley was present. Mr. Kirtley has ceased to be a plumber now, and is in the manufacturing business, but I expect he will make himself known to a great many old friends at this convention. Dent Yates was also there as a delegate from Kansas City.

L. POPLOWSKY, CLEVELAND, O.

It was at this convention that a number of manufacturers made exhibits in one of the rooms of the building and Mr. Gabay, of New York city, objected to manufacturers showing their interest in a convention in that way. Mr. Sheehan, of St. Louis, presided at this convention and made an excellent officer. Mr. Hannan called attention to the fact that three prominent members of the associa-

tion had died during the past year: Mortimer J. Lyons, of Brooklyn, Enoch Remick, of Philadelphia, and N. B. Hussey, of Omaha. The first two named were present at the first convention of the national association, Mr. Remick having been financial secretary of the association for seven years.

It was at this convention also that the practice of giving badges of service to ex-presidents was started, and a beautiful maltese cross set with diamonds was presented to Mr. Sheehan. Rundle-Spence Mfg. Co. gave a fete at Schlitz Park, and a jolly time was had by every one.

THE twelfth annual convention was held in Detroit, in 1894, and was the scene of a vigorous battle for the presidency. Mr. Finnerty, of Boston, was the president and kept his hand on the throttle during this convention. Among the delegates, I remembef, was John B. Smith, of Lewiston. I think this was the first convention John attended, but he has been first vice-president for his state, Maine, ever since. From Ft. Wayne came Emmitt Martin, a well known plumber-inventor. Kalamazoo, Ann Arbor, Jackson, Lansing, and all the other small towns in Michigan were well represented. The Kansas City delegation was headed by Capt. Henry Goss, whose geniality will impress itself on everybody at the Kansas City convention. There was a big fight at this convention on the admission of delegates from states, which consumed nearly all of the first session, the question being on the admission of thirteen delegates from Michigan. I remember a remarkable piece of poetry perpetrated on the convention by a Chicago man, who said that in order to make the home of the soul an earthly paradise: ·

The heart must pump in temperate mood,
Life blood through each artery and vein;
The stomach wisely fed with wholesome food,
And rest afforded the weary brain.

The body of its wastage purged,
And cleansed by exercise and bathing;
The senses by excess not blurred,
And lungs pure air inhaling.

It was at this convention they had so much fun with Mr. Cross about his "celebrated island surrounded with water." I do not think the trade will ever forget that break of Mr. Cross. It was also at this convention that Braden tried to get the association to go to Texas for its meeting but did not succeed until a number of years later.

THE Philadelphia convention was held under the gavel of John Mitchell, of New York City. This was the first convention at which we had the pleasure of welcoming a delegate from Canada, in the person of John Date, of Montreal. The number of delegates continued to increase at this convention, showing that the associations were still growing. Among the people I remember first seeing here at this convention (although I am not certain it was the first convention they attended) was John H. Birchall, of Allentown, Pa., a quiet modest gentleman who was recently very much scandalized by the publication of a ludicrous picture of him in a New York paper. Charleston, S. C., had a delegation at this meeting, and I do not remember seeing any delegates from there since. In the Chicago delegation I remember Joe Breen. I hear now that he has left the Windy City and gone in business at some smaller town in Michigan. Wherever he goes you can rest assured he is a strong association man. The Cincinnati delegation contained Oliver Schlemmer,

W. H. DOYLE, Philadelphia.

who in addition to being a good plumber, is the inventor of a number of of specialties for plumbers and steam fittters. The Connecticut association sent Wm. Vanderman, of Willimantic, Conn., also an inventor whose tools have become to be known all over the world. From Hartford, Conn., there was Jas. Ahern, a wise and patriotic man who has the interests of the association very much at heart and whose defense of the New York Conference Resolutions I read with a great deal of interest in a recent number of Domestic Engineering. Illinois would not consider herself well represented now, unless Jack O'Neill, of Peoria, was among the delegates. Jack is a most interesting young man who has his friends by the hundreds. Always glad to shake his hand. In the Louisville delegation was Mike Duffy who does not say very much, but always votes on the right side of questions.

T. P. CULLOTON, Chicago.

I remember the first cause of discussion at the Philadelphia convention was a very curious one. At the previous convention a committee had been appointed of which Edward Hayward, of Brooklyn, was a member, to revise articles 4 and 5 of the constitution effecting representation. Mr. Hayward made a report which was a complete draft of a new constitution, and there was a good deal of discussion as to whether the committee had exceeded its powers. There was a whole lot of oratory let loose upon this subject, and it ended up by making the committee take its report back.

It was at this convention also that Patrick Tierney, our present president, acting for the Providence Master Plumbers Association, suggested that a national organizer be appointed, but the matter was laid on the table without any discussion. In his report I remember Mr. Mitchell created quite a sensation by stating when he received the office of president there were not over twenty-five copies of the Baltimore Resolutions bearing signatures, on file. When he closed there were two hundred and seventy-five signatures. Mr. Mitchell made a good president.

Mr. Doyle presented on behalf of the Philadelphia Association a beautiful flag which was accepted with great cheers.

The Steam and Hot Water Fitters Association had a good delegation to meet the plumbers, in the persons of the late Chas. J. Gillies, of New York City, and John W. Mills, then of Chicago, but now in the wholesale business in Providence.

It was also at this convention that a fight was made upon the practice of the United States government specifying one particular closet. It also asked manufacturers of earthenware to put their names upon their goods. There was also an attempt at this meeting to have the National Association of Steam Fitters and the National Association of Master Plumbers cooperate in any case of violation of trade resolutions, but it did not seem to amount to much. Mr. Meathe was elected president here. Mr. Tierney came near being nominated vice-president, but he refused the honor.

The next convention met in Cleveland under the presidency of Mr. Meathe, Mr. Ellen, of Cleveland, welcoming the plumbing people to Cleveland. Robert McKisson, the mayor of Cleveland, made a speech in which he showed himself to be perfectly invulnerable to ridicule. This convention had 434 delegates, and it was a very lively and active convention. The president's report showed that a great deal of work had been done in the organization of associations in different locations. There was a good deal of trouble over the violation of the Baltimore Resolutions, a number of firms having been placed on the black list.

The Providence Association tried to get the national president elected for two years instead of one, at this convention, but it was defeated. The Wisconsin Association tried to get the manufacturers and jobbers to withdraw their low list prices and substitute the old high list prices instead. Minnesota came to the front with an endeavor to discourage the organization of cooperative jobbing houses by the plumbers. The Chicago association tried to get galvanized iron pipe put upon the list of plumbing supplies. Altogether, the Cleveland convention was a very interesting one. Mr. Doyle, of Philadelphia, was easily elected president.

The convention of 1897 went to New York, to which place they were welcomed by Gen. Geo. B. Scott and Samuel L. Malcolm, both prominent plumbers. A beautiful gavel was presented by Mr. Kranichfelt. About the first thing that the convention did was to turn the press out and go into executive session. The credential committee made a report showing about 475 delegates, including a delegation from Arkansas and Florida,

two states not heretofore represented according to my memory.

The San Francisco delegation was headed by John L. E. Firmin, the orator of the Pacific slope. The Chicago delegation contained a whole lot of new men this time, some of the old men being left at home. The Louisiana delegation was headed by J. H. Aitken, of New Orleans, a gentleman who is well known all over the United States.

The Michigan delegation was headed by Col. Wm. T. McGurrin, of Grand Rapids, Mich., a well known plumber who has been a member of the Governor's staff and who is thoroughly well liked in his state.

Brooklyn only had two delegates which was a curious thing. I never quite understood how that was. Pennsylvania was headed by Robert Drummond, of Philadelphia, who is still prominent in association matters. From Milwaukee came Hermann Wittig, a thoroughly conscientious and honorable plumber who in his time was of very great use to his local association. Hermann was drowned last winter in a lake near Milwaukee where he went fishing, and a most melancholy death it was.

Mr. Tierney brought up the question of the national organizer again, but he was unable to win the convention over to his views. Mr. Braden made himself a very prominent champion of the proposition, and described the efforts he had made to organize the south. He also attempted to have Mr. Hyde address the convention, but this called forth a spirited discussion, and the result was that Mr. Hyde was asked to speak, but under such circumstances that he refused to have anything to say.

It was during the presidency of Mr. Doyle that so many firms withdrew from the Baltimore Resolutions because of the clash between the association and the various supply associations.

From New York to San Antonio, Texas, was the next jump made, the delegation being welcomed on behalf of the San Antonio people by a lawyer named Flores. Mr. Braden also welcomed the delegates, and there was no lack of hospitality on

JOHN MITCHELL, New York.

the part of the San Antonio people. The attendance dropped off somewhat, only 384 delegates being reported. It was at the San Antonio convention that I remember that celebrated Badger fight in which Mr. J. W. Brown, of Chicago, was victimized so completely.

This convention did one memorable thing which has saved a lot of trouble since. The association decided "That associations have no right to send out notices regarding supply houses to others than their own members." The association also took action upon manufacturers and dealers figuring on jobs, and passed a resolution instructing manufacturers and wholesalers to refrain from such estimating. In a way these various steps toward securing trade protection are very interesting. If they could be studied carefully it would be seen that the evolution of trade protection has been slow but steady and sure, and that one step after another has been taken until the trade has a degree of protection which is perhaps better than that enjoyed by any other trade.

It was at this convention also that the Indianapolis association endeavored to secure a new interpretation of the term "Master Plumber." They wanted a master plumber to be one who has a public place of business on a public street. This did not meet with the approval of the association.

The old question of having a national organizer came up here at San Antonio again, being introduced by the Indianapolis association, but the convention would have none of it. Mr. Culloton was the president who presided at San Antonio, and he made a good president, too. He was energetic, prompt and positive, and increased the membership of the association quite a good deal.

The entertainment at San Antonio was different to that which had been provided at any previous convention. There was a military establishment of the government near by, and the soldiers attracted the attention of all the ladies, and as many of the delegates as could get away from the meetings. Some of the plumbers also took in the Mexican excursion and enjoyed it greatly.

At this convention it was also decided that hereafter the directory of master plumbers issued by the association should contain names of only members of the association, instead of the entire trade, as had been done before. New Orleans made a great fight to get the convention of the next year to be held in their city, and won out, although it was rather singular that the association should go south two years in succession. P. M. Murphy, of Chicago, was elected president at this convention.

The New Orleans convention in 1899 was memorable in a good many ways, principally because of the strenuous endeavor made to modify the Baltimore Resolutions so that manufacturers and dealers should be required to sell to members only. It made the convention interesting, and the result made it memorable. For a year the New Orleans amendment attracted the attention of the entire trade, and after being given a fair trial proved to be not what the trade wanted. In some respects the New Orleans convention was notable, principally in that there were some good essays presented. I, for one, hope that the days of essays will come back, and that we will have some more.

It was also pleasant to see John S. Kelley, president of the United Association of Journeyman Plumbers and Gas Fitters, who made an excellent, instructive address. He gave us a good many ideas about our trade that we did not have before. I hope some day to see the journeymen and masters working more closely in harmony. Mr. Malcolm, of New York, was the presiding president, and P. M. Murphy, of Chicago, was the newly elected president, and our present president, Mr. Patrick Tierney, of Providence, was nominated for president by our present vice-president, Mr. Hornbrook.

The entertainment in New Orleans consisted of a trolley ride for the ladies on different days, and a reception and ball at the Atheneum, and a river excursion.

It does not seem necessary for me to give many reminiscences about the last convention held at Baltimore. The principal action at the convention was the

P. M. MURPHY, Chicago.

adoption of the New York Conference Resolutions, which have been in force during the past year and which will come up before the convention in Kansas City as modified by the recent conference between our president and the president of the National Committee of the Confederated Supply Associations, for endorsement or rejection by our convention. No plumber can fail to realize that the resolutions have not given entire satisfaction in all parts of the country, but whether the trade will continue them in force is a problem which no one can tell at the present time. Whatever happens, I hope we will have thorough harmony and cooperation with the manufacturers and jobbers, because unless we have a fair reciprocal relation we can never hope to accomplish much.

SOMETHING FOR NOTHING.

E. Rutzler, 176 and 178 Center street, is giving away a neat little vest pocket note book. A few of the pages are devoted to a partial list of office buildings, hotels, residences, etc., in which Mr. Rutzler has installed heating apparatus and power plants. Among the number is the Park Row office building thirty-one stories in height, which is the tallest building in the world.

WILL HAVE TWO EXHIBITS.

The Iron Clad Manufacturing Company, 2, 4 and 6 Cliff street, will have two exhibits at the Pan-American Exposition. One will be in the Manufacturers' building and the other will be in the Dairy Supplies building.

In the exhibit in the Manufacturers' building the Iron Clad Company will have on exhibition the full line of goods they manufacture—hot water heaters, pressed steel sinks, galvanized iron ware and engineers' and mill supplies, etc. A complete line of milk cans, etc., will make up the other exhibit.

H. C. Cochrane, of the Iron Clad Company, will leave Monday for Buffalo. Mr. Cochrane will have charge of one of the exhibits all during the exhibition. Mr. Misner will look after the milk can exhibit. All of the company's salesmen will be given an opportunity to spend a week or more at the exposition assisting with the exhibits.

National Association of Steam and Hot Water Fitters

In 13th Annual Convention at Niagara Falls, June 10-12, 1901

IN the assembly hall of the palatial and picturesque International Hotel, within sound of the thunderous echoes of the world's greatest cataract, the thirteenth annual convention of the National Association of Steam and Hot Water Fitters was opened shortly before noon on Monday, June 10th, by President Francis A. Williams, who announced the following committees:

CREDENTIAL COMMITTEE.

A. E. Kendrick, Brookline, Mass.
Warren W. Biggs, Washington, D. C.
John W. Danforth, Buffalo, N. Y.
E. Tunstead, Minneapolis, Minn.
Wm. P. Thompson, Philadelphia, Pa.

CONSTITUTION AND BY-LAWS.

Stewart A. Jellett, Philadelphia, Pa.
J. Leland Wells, New York, N. Y.
A. E. Kendrick, Brookline, Mass.
J. W. Moore, Minneapolis, Minn.
A. O. Neal, New York.

APPEALS AND GRIEVANCES.

E. Rutzler, New York.
John T. Bradley, St. Louis, Mo.
P. Gormley, Philadelphia, Pa.
J. Henry Howe, Rochester, N. Y.
John T. Sadler, Elmira, N. Y.

GOOD OF THE ORDER.

Edward Tunstead, Minneapolis, Minn.
Paul H. Kendricken, Boston, Mass.
John J. Collins, St. Louis, Mo.
Jerome Hubbard, Washington, D. C.
P. F. McGinn, Pittsburg.

WAYS AND MEANS.

John D. Hibbard, Chicago, Ill.
Arthur C. Walworth, Jr., Boston, Mass.
Chas. A. Criqui, Buffalo, N. Y.
Edward Joy, Syracuse, N. Y.

AUDITING COMMITTEE.

A. M. Chambers, New York.
J. V. Archambo, Minneapolis, Minn.
John W. Danforth, Buffalo, N. Y.
C. A. Stock, St. Louis, Mo.

COMMITTEE ON DISTRIBUTION OF REPORTS.

Elias D. Smith, New York, Chairman.
John B. Hughes, St. Louis, Mo.
B. P. Hall, New York.
Cornelius Kendall, Toledo, Ohio.
C. H. Sanborn, Boston, Mass.

President Williams then read his annual address, which was received with applause:

Gentlemen of the National Association of Master Steam and Hot Water Fitters, Assembled in Convention:

As President of your Association, I extend to you a welcome and cordial greeting to this, our thirteenth annual convention.

The past year, since my election to the highest and most honorable office conferable by you, has been a most pleasant one for your President in his relations to and with the association officers and members.

It is not my good fortune to be able to present to you any radical departure or new methods promulgated during my term of office; on the contrary, the line of work passed upon has been of ordinary and routine character.

We now meet again in convention to formulate legislation for our members as a national body, always bearing in mind that local conditions should be so modified as to conform and harmonize with the general laws of our national association.

The matters of general interest which I consider should be brought to your attention, at this time, by me as President, have been briefly noted, and I thank you in advance for your attention.

EXECUTIVE COMMITTEE.

After many years of continuous service as an Executive Committee member, I have taken great pleasure in the continuance of active service on the subcommittee selected to transact the detail business of your association. Many conferences and regular meetings have been attended during the year and the committee have been called upon to decide questions of considerable importance to the trade in the form of complaints, suggestions, administration and general good of the order. The details of the work will appear in reports from this committee and your Secretary and Treasurer. The Chairman of the committee is a veteran in the order and a past-master in the fullest sense of the title and has proved an able critic and censor in the publication of your "Bulletin." He is worthy of every confidence and honor your association is able to bestow upon him, and I sincerely hope he may be able to consider a further continuance of active service in this association.

FINANCES.

The finances of the association as presented to you by your Treasurer's report is evidence of the prosperous and active condition of the association. Without showing any material change from our reports of last year, we have been in a more settled condition, the returns from associations and individual members having been received regularly by the Treasurer.

I desire to impress upon you the necessity of having a Secretary and Treasurer appointed from the same city, in order that each may receive the support of the other, and by such intercourse a systematic set of books and accounts can be more properly kept, as your Auditing Committee will, during this meeting, have an opportunity to testify.

The Treasurer has been aided by your Secretary in conducting the financial affairs of the associtian of which he has control, as was evidenced during a protracted period, when our Treasurer, Mr. Hall, was incapacitated by a severe and serious illness, during which time the Treasurer's books of accounts were kept up to date at National Headquarters by our Secretary.

The defense fund has been increased during the year only by the accrued interest, and there has been no call or necessity for the use of the principal, which is placed on deposit in a trust company, subject to call, should the occasion arise.

This fund should be continued and increased, if possible. I presume every member of this association is fully aware of, and appreciates the great value to be derived from having such a fund on hand under united national organization. No one can tell when a time will arrive when some individual member, or members, may require the support of the National Association.

If a time should arrive when it becomes necessary for a member to call upon the National Association for the protection which this fund is contemplated to give, it certainly would be a source of gratification to such member to know that there is a substantial sum on hand which can be drawn upon to render assistance under the experienced guidance which the Executive Committee could give.

OFFICIAL BULLETIN.

The "Official Bulletin" has been published each month and sent to members and subscribers throughout the country, and is, without doubt, a medium through which our advertisers and members are brought in closer relationship.

I trust this organ of the association has been the means of giving to the manufacturers "in accord" an increase of trade from our members, for I cannot express too strongly the desires of myself and the officers of your association to be loyal to those manufacturers and dealers who have been loyal and steadfast to our members.

The policy inaugurated last year of receiving unsolicited support from our advertisers has been continued, and the results, as heretofore, have been gratifying.

STANDARD FLANGES.

The subject of standard flanges has been presented to you in different forms at each convention, and last year a committee was appointed to modify and perfect minor details in order to better provide a general standard for varying conditions.

It is to be hoped that the report of your committee will be one that will present as nearly a perfect and standard schedule as can be prepared, that will be satisfactory to manufacturers for all ordinary pressures and conditions governing our business.

I would recommend that the trade at large, but especially our members, specify and order from the manufacturers and dealers "in accord" goods with flanges made in accordance with our standard flange schedule.

ANNUAL CONVENTIONS.

Our association being an incorporated body under the laws of the State of New York, is required to fix a time of holding the annual meeting.

At the time of incorporation it was considered that the interest and convenience of all would be best served by specifying the month of June as the season to hold our meetings. Reports received from our Secretary would make it appear that some members prefer an earlier date than June should be fixed at time for meetings. This is a matter that can best be considered now by members assembled.

TRADE RELATIONS.

The trade resolutions passed at the eleventh annual convention, held in Buffalo, June 7-9, 1899, seem to have been misinterpreted by some manufacturers and dealers, and especially the provisions to exempt consumers. One point in particular is the exemption of concerns having in their employ men engaged at steam fitting. It may be well to remind you that the Buffalo resolutions supersede any and all other resolutions passed in convention.

It has been suggested by some manufacurers with whom we have had business relations that a modification of the exempt consumers clause be made, so as to provide a differential list on proposed lines; allowing manufacturers to sell a certain class of customers not included in the present exempt consumers' list.

I would recommend that this be given serious thought and full debate, and an effort made to solve this important question in a manner that will prove satisfactory to this association and the manufacturers and dealers upon our List in Accord.

Another question of vital interest to the trade is one which is often brought to our attention, viz. the making of plans and specifications for consumers and others by boiler manufacturers. This practice is certainly a pernicious one, and if it can be remedied in no other manner, I would recommend that members of this association and the trade at large concentrate their purchasing power by confining their dealings to manufacturers "in accord" who will refrain from making plans and specifications. The subject should receive the careful consideration of local associations and individual members where no local association exists.

IN GENERAL.

There are matters which will be presented to you in executive session by your Executive Committee, Treasurer and Secretary, and one in particular which the Committee on Good of the Order will be called upon to report to you during the present session.

I trust that the convention will devote sufficient time and its best energies in the endeavor to effect legislation which will be of real and lasting benefit to the members of this organization.

My thanks are tendered to the Executive Committee, Secretary and members for the uniform courtesy which has been shown me during my term of office.

I trust that we may meet at future conventions under as favorable circumstances and conditions as exist in the affairs of the association at this time.

(Signed.) Francis A. Williams,
President.

A resolution was moved, seconded and carried that the repart of the Executive Committee be read in executive session.

Treasurer Henry L. Hall, of New York, presented his report, of which the following is a recapitulation:

Amount on hand June 1, 1900	$2,868.52
Receipts for year ending May 31, 1901	6,761.03
Total	9,629.55
Expended June 1, 1900, to May 31, 1901	6,917.27
Balance on hand June —1901	$2,712.28

Secretary Henry B. Gombers, of New York, read his annual report, which was received and placed on file.

SECRETARY'S REPORT.

To the President and Members of the National Association of Master Steam and Hot Water Fitters.

Gentlemen:

My fifth annual report will be confined to a very few subjects, for the reason that in the report of the Executive Committee mention is made of much of the business which we have had occasion to jointly consider and dispose of.

The President, Chairman of the Executive Committee and Treasurer being located in New York City, within easy reach of National Headquarters, and the National Vice-President, although living in Philadelphia, having been present, with few exceptions, at committee meetings, there has been a more even distribution of the work and much prompter service in the handling of details than in previous years.

Whenever the other members of the Executive Committee have been called upon for advice or action they have readily responded and have given their valuable advice and assistance.

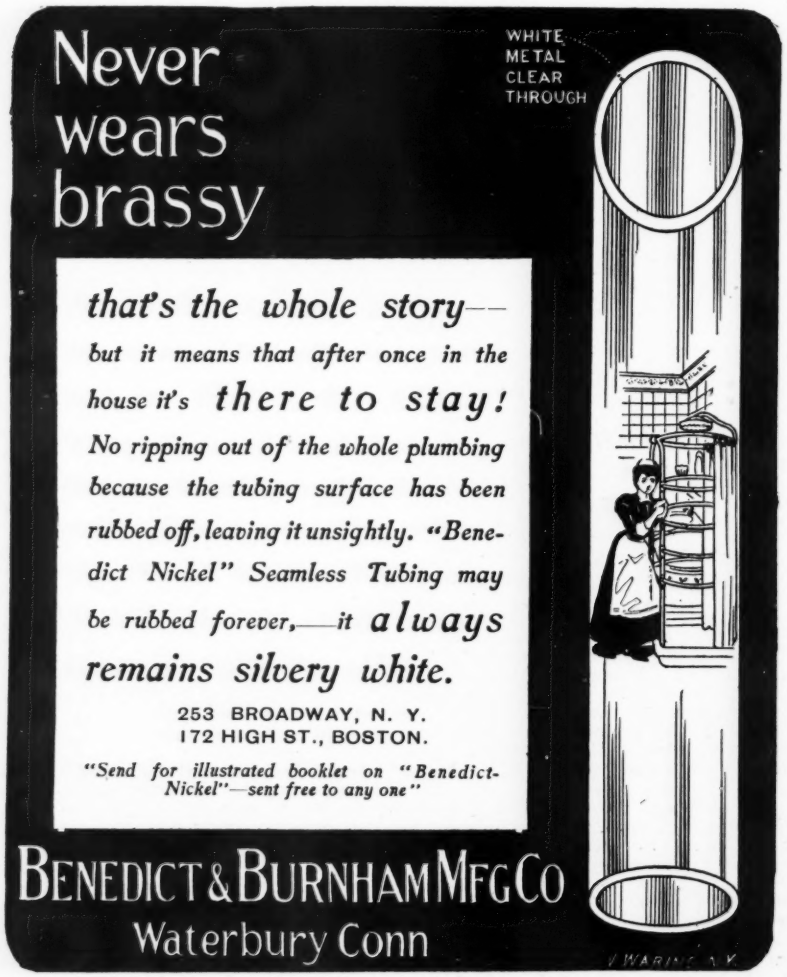
The sub-committee, having taken charge of the detail work, has relieved the other members from personal attendance at meetings held at headquarters, and there has arisen no question which would require the action of the out-of-town members that could not be communicated to them by mail or telegraph.

OFFICIAL BULLETIN.

In April, 1897, the policy of the association regarding the methods to be employed in the issuing of the "Official Bulletin" was rather indefinite in the mind of your Secretary, but it was not long before the true intent and purpose of this feature of his work was made clear to him. Having acquired the knowledge that the association was desirous of making the "Official Bulletin" an organ in which official announcements could be published to the members, to the manufacturers and dealers on List in Accord, as well as to the trade generally, your Secretary has endeavored to follow this line of policy under the direction of the National Executive Committee. I do not recall a single instance where any just or serious complaint has been made concerning our management, and it is due to the members that this information should be placed in their hands.

We have heretofore requested our members to furnish articles on heating and ventilating, or other subjects that would be interesting to the trade, in order that they could be published in the "Bulletin." Such invitation has not brought forth the responses we would have desired; nevertheless, the readers of the issue for current month (June) have had the pleasure of noting an article on "Trade Abuses," which is to be followed in succeeding months by articles from the same author.

There is almost always room in the "Bulletin" for just such articles, and the members can serve the best interests of


Never wears brassy
WHITE METAL CLEAR THROUGH
that's the whole story—
but it means that after once in the house it's there to stay!
No ripping out of the whole plumbing because the tubing surface has been rubbed off, leaving it unsightly. "Benedict Nickel" Seamless Tubing may be rubbed forever,—it always remains silvery white.
253 BROADWAY, N. Y.
172 HIGH ST., BOSTON.
"Send for illustrated booklet on "Benedict-Nickel"—sent free to any one"
BENEDICT & BURNHAM MFG CO
Waterbury Conn

the trade by voicing their sentiments between conventions, by using the pages of their official organ.

COMPLAINTS.

The data referring to complaints made against concerns on List in Accord is on file at headquarters, where it is at the disposal of all who are entitled to same.

The disposition of complaints investigated is presented in the Executive Committee report. In this connection I desire to call especial attention of members to the necessity of furnishing the committee with positive and definite evidence in support of their grievances, and not take hearsay evidence as a basis for making complaints.

In every instance but one where the committee has found it necessary for a defendant to appear at headquarters in answer to a charge, there has been a prompt and ready response to the request.

ORGANIZING.

It is the intention of your Secretary to make an occasional visit to cities where there are local associations, and as far as possible to call at places where there is any likelihood of being of service in the way of interesting the trade in the formation of a local to affiliate with the National Association.

During the past year I have traveled as far Northwest as Minneapolis and St. Paul, Southwest to Kansas City, St. Louis, eac.; East to Boston; and South as far as Washington, D. C.

* * *

More real organization can be accomplished by a slight personal effort of those now in the association, than by tons of printed matter and hundreds of dollars expended for postage.

There are some so-called master steam fitters in the business who would not add any dignity or worth to this association, and such people we do not invite or care to have become members, but members already enrolled in our number can readily discriminate in this matter and extend the invitation only to those who would be acceptable associates.

EXECUTIVE COMMITTEE.

The members of the Executive Committee have been uniform in their courtesy, and in the assistance which they have extended to me in performing the duties assigned. They have readily responded to calls for special attendance, when occasion warranted, and the members not resident in New York or vicinity have performed their duties in a manner to warrant the thanks of the association.

I desire at this time to extend to the committee my sincere thanks for their consideration, and at the same time to express my appreciation for their attitude in sustaining my efforts to carry out the spirit, as well as the letter, of the constitution of the association.

SECRETARIES.

It is not always best to say too many nice things about your associates, for fear that some misinformed, or perhaps jealous, hearer might misconstrue the motives of the speaker or writer; but I cannot refrain from giving credit to the Secretaries of State and Local Associations who have been so prompt in attending to the correspondence with National Headquarters.

They appreciate quick responses to communications from tthe members and others in their jurisdiction, and it therefore must be clear to them that they should respond quickly to all communications from National Headquarters. During the past year there has been little to find fault with, and if the improvement continues in the same ratio the coming year, it will be a source of gratification to the officers responsible for the administration of your affairs.

CONDITION OF THE ASSOCIATION.

You will remember that last year I closed my report by expressing the hope that the association would continue to show an advance in its affairs. I believe my hope has been realized. There has been no immoderate display of aggressiveness, no bluster or boasting, no unreasonable or arbitrary actions taken, to which objection could fairly be made; on the contrary, we have gone along in a quiet business-like manner, endeavoring to conduct the affairs of the association in such a way as to secure and maintain the respect of those with whom we have dealt.

Evidence of the friendly attitude assumed by manufacturers toward the association can be found in the report of your Executive committee, and by further oral testimony which can be given by members of the committee or your Secretary; at least testimony on such matters as it would be proper to disclose.

The financial condition of the association is sound, and there is no doubt but what it will remain so, for the reason that there is a sufficient number of men in the organization who recognize its worth and who are always to be found at the front in its support.

Many reasons could be advanced for believing that the association is on a much firmer basis that it has been at times in the past. There is one feature, however, that should receive special mention, and that is, the friendly feeling that exists between members and the expressed desire to stand together on questions that involve the interests of the association, as well as to give their countenance and aid to movements looking toward the betterment of the conditions of the trade at large, even where it must of necessity benefit people in the business who are not members of the Master Steam and Hot Water Fitters' Association.

The strength that is inherent should be developed, and be permitted to show itself by acts of such a character as will further earn the approval and applause of all reputable people in the business.

I hope that the coming year will bring to the association a full measure of success and prosperity, which it is entitled to receive, and that each individual member may participate therein.

Respectfully Submitted,

(Signed) Henry B. Gombers,
Secretary.

The reports of State Vive-Presidents and Secretaries of local associations were referred to executive session.

An adjournment was then taken for lunch and on re-assembling in the afternoon the convention went into executive session. The following is the report of the Executive Committee, which was received and approved.

To the Officers and Members of the National Association of Master Steam and Hot Water Fitters.

Gentlemen:—We herewith tender you report of the Executive Committee giving a brief resume of the business affairs for the past year.

INCORPORATION.

At the annual convention held in Boston, Mass., June 8th, 1900, the Association at a regular session voted to abandon the Illinois State Charter under which the Association had conducted its business, and decided to tender all its goods, chattels and list of members to the National Association of Master Steam and Hot Water Fitters, which had been incorporated under the laws of the State of New York by members of this organization, having in mind the best interests of all concerned.

The instructions given by the convention to take steps to abandon the Illinois State Charter have been fully carried out, and we now have in our possession a certified copy of the "Final Dissolution of the National Association Master Steam and Hot Water Fitters," received from the Secretary of State of Illinois.

Under the Charter granted by the State of New York, it is necessary to elect eight (8) directors. In order to comply with this condition, the Association amended Article XIII. of the Constitution so that it reads as follows:

"The National Executive Committee shall consist of eight Directors or Trustees as provided for in Articles of Incorporation, three of whom shall be the Pesident, Vice-President and Treasurer; the other five being elected at the Annual Convention."

As the Association had been incorporated by eight (8) members acting as incorporators to serve as directors until the first annual election, it became necessary to comply with the provision of the National Constitution by electing officers and directors as provided therein. At the meeting in question this was done by the election of Messrs. John J. Collins, St. Louis, A. E. Kenrick, Brookline, Mass., George Mehring, Chicago, Elias D. Smith, New York, and John W. Danforth, Buffalo, as the five (5) directors, and Messrs. Francis A. Williams, New York, President; Stewart A. Jellett, Philadelphia, Vice-President; and Henry L. Hall, New York, Treasurer, making eight (8) directors in all, to serve for the fiscal year 1900-1901 or until their successors were elected and qualified.

ELECTION OF CHAIRMAN.

The first meeting of the eight (8) newly elected directors sitting as the Executive Committee, was held in Parlor "E" of Hotel Brunswick, in Boston, at eleven (11) o'clock a. m., Friday, June 8th, immediately after the adjournment of the morning session of the convention, all the members being present. The committee organized and elected Elias D. Smith of New York as Chairman of the Executive Committee for the year.

ELECTION OF NATIONAL SECRETARY.

At the above mentioned meeting the committee elected as National Secretary, Henry B. Gombers of New York, he having served in that capacity since April, 1897.

SURETY BONDS.

Under the provisions of the Constitution of the National Association, the National Treasurer and the National Secretary are required to provide surety bonds, and in accordance therewith the aboven amed officers delivered to the Chairman of your committee bonds of an approved surety company for the amounts called for.

ADMINISTRATION.

At a meeting of the Executive Committee heretofore mentioned, Messrs. Francis A. Williams, Stewart A. Jellett, Elias D. Smith and Henry L. Hall were duly made a sub-committee to transact detail business in such matters as would not be necessary to present to the entire committee.

On receipt of the resignation of Mr. John W. Danforth from the Executive Committee, June 15, 1900, that committee filled the vacancy by the choice of Mr. Edward Tunstead of Minneapolis, who was unanimously elected and kind-

ly accepted the action of the Executive Committee.

A large amount of detail work has been disposed of during the past year by the sub-committee, which it would have been practically impossible to have disposed of had it been necessary to present same to every member of the National Executive Committee.

Such questions as it was necessary to refer to the members distant from National Headquarters were submitted to them for their consideration and approval.

As stated in former reports, our National Headquarters are open every day in the year except Sundays and holidays.

The committee has followed the provisions of the Constitution and By-Laws to the minutest detail in conducting the affairs committed to its charge and each member has endeavored to faithfully fulfill the duties assigned, thereby hoping to merit the confidence and trust shown by you in selecting them to take charge of the affairs of the Association for the year.

The statements to be presented to you cover a period from June 1, 1900, to May 31, 1901, and in this connection we will state that it is necessary to have a set time for closing the books in order that the accounts may be made up in time to present to the National Convention.

OFFICIAL BULLETIN.

Twelve numbers of the "Official Bulletin" have been published during the past fiscal year; copies thereof having been sent to members and other subscribers regularly. Sample copies as well as special numbers, have been sent to master steam and hot water fitters who are not members of this Association, as well as to manufacturers and dealers, whose names do not appear on our List in Accord, for the purpose of calling their attention in this way to the fact that the National Association of Master Steam and Hot Water Fitters has been in existence a number of years and proposes to continue to carry on its good work, trusting that those not identified with the organization will some day see the wisdom of placing themselves in closer touch with us.

The policy of the Association in publishing the "Bulletin" has been to avoid interfering in any way with the trade papers. At the same time we mean to render whatever service we can to those manufacturers and dealers whose generous support in advertising helps lessen the expense of printing and distributing the many copies which go to the trade generally throughout the United States. Our members and the trade ought not to overlook these advertisers when placing orders for supplies. The members and those familiar with the methods employed by the recent administration recognize the fact that the "Official Bulletin" is published as a means of communication with members and the trade generally, and that its field of usefulness extends where perhaps none of the trade papers could reach.

STANDARD FLANGES.

In our report last year we called the attention of the Association to the fact that some criticism had been made upon the practical working of the schedule on some pipe sizes, and therefore the Committee recommended the appointment of a special committee to confer as to a few minor changes in the schedule. At last Convention such a Committee was appointed, and they will later on during the sessions of this Convention make their report.

TRADE RESOLUTIONS.

It is interesting to note that there have been more unsolicited applications to be placed upon our List in Accord received from manufacturers during the past year than at any time for three years previous.

Wherever it is possible to accede to the request of reputable manufacturers, it has been the policy of the Executive Committee to comply with same. As a result of our policy in carefully selecting and passing upon all applications, we can report an increase of thirty-eight (38) addresses of firms whose names appear upon our List in Accord.

During the same length of time we have dropped from our List of Accord twenty-seven (27) names and addresses by reason of discontinuance of business, or abandoning certain offices, or that former members of the Association are no longer entitled to appear upon the List in Accord as manufacturers and dealers, while they are doing contracting work.

No names have been removed by the Executive Committee by reason of violations of Trade Resolutions, neither has any one on the list, who is still in business, voluntarily withdrawn their name.

We recommend to the officers and members of the State and Local Associations, as well as to the Star members, that they make an effort to obtain signatures to the Trade Resolutions from reputable manufacturers and dealers who are not now on the List in Accord.

IN MEMORIAM.

At the eleventh annual convention, held in the city of Buffalo in June, 1899, the death of Charles J. Gillis, of New York, was announced. Mr. Gillis was one of the early presidents of the National Association of Master Steam and Hot Water Fitters.

This year we have to announce the death of two other pioneers in the steam heating business. On March 31st, 1901, John Davis, of Chicago, and on May 6th, 1901, John Jewell Smith, of New York, passed away.

Mr. Davis was elected president of the Master Steam and Hot Water Fitters Association of the United States at a meeting held in 1889, called for the purpose of organizing the steam heating trade.

Mr. Smith, on the other hand, although in sympathy with their objects, never occupied an office in any of the Master Steam Fitters organizations with which his firm was identified.

Your committee on resolutions will be called upon to prepare and present minutes upon the death of Mr. Davis and of Mr. Smith.

Your committee in presenting this, their annual report, feel confident that you will give the subjects therein commented upon your best consideration, and that you will act upon them in such a way as to meet with the approval of our members.

Respectfully submitted,
(Signed) Elias D. Smith, Chairman,
John J. Collins,
Henry L. Hall,
Stewart A. Jellett,
A. E. Kenrick,
George Mehring,
Edward Tunstead,
Francis A. Williams,
National Executive Committee.

SECOND DAY'S SESSION.

President Williams rapped for order at 10:45 a. m., and announced the following committee on nominations for officers for the ensuing year:

Geo. A. Suter, of New York; John Gormly, of Philadelphia; E. Rutzler, of New York; Geo. T. Coppins, of Boston; P. H. Kendricksen, of Boston.

A committee, consisting of E. D. Smith, E. Rutzler and James Curran, all of New York, was appointed to draft resolutions on the death of John Davis, of Chicago, and Geo. A. Suter, S. J. Geohegan and A. N. Chambers were named to frame a memorial on the death of John J. Smith, of New York. The convention then went into executive session, which lasted until the recess for lunch.

The first part of the afternoon session was also taken up with executive business, after which the doors were thrown open and reports from committees appointed in the morning were submitted, as follows:

The committee appointed to draft resolutions on the death of Mr. John Jewell Smith reported as follows:

No top washers or packing
No small nuts or fine threads
Both seat & washer accessible
Quick and easy to operate

Features of the Apex Faucets obtained by a radical change in the construction of the working parts.

MADE ONLY BY

Homer Brass Works
(Incorporated)
231 Race St., Philadelphia
Established 1828

It is with great regret that we record in this minute the death, on May 6th, 1891, of our esteemed fellow member, Mr. John Jewell Smith, of New York, for many years widely and favorably known in our trade.

Commencing his business career as a young man in 1858, associating himself with the late William C. Baker, under the firm name of Baker & Smith, when our trade was in its infancy, he was one of the pioneers who blazoned the way and developed many of the principles on which our work is based, and soon became one of the prominent leaders of our profession. His extraordinary executive ability, excellent judgment and sterling integrity were the foundation of his successful career, and his genial and kindly nature endeared him to all who had the good fortune to know him.

The association, in convention assembled, tender to his family their heartfelt sympathy, and assure them of the high esteem in which they hold his memory.

(Signed) G. A. Suter,
Stephen J. Geohegan,
A. N. Chambers,
Committee.

IN MEMORIAM—JOHN DAVIS, OF CHICAGO.

In making this formal minute of the passing away on March 31st, last, of our late associate, your committee feels that words alone cannot fully express its sense of our loss. From the earliest inception of the association until his death he threw the whole weight of his strong and earnest personality into its work, and very largely enabled it to attain to its present influential position.

Born and reared amid the sturdy influences of the Green Mountain State, but removing in early manhood to the wide opportunities of the middle west, he combined in his character the independence of the one and the wide breadth of thought and action of the other. These traits, with an inbred honesty of purpose and a natural courtesy of manner, served to attach to him hosts of friends who to-day mourn their loss. For a few only of these we speak, but we can bear hearty testimony to the unfailing geniality, the business rectitude and the whole-souled generosity of a man who filled his position in the business world in such an acceptable manner as to make that world much poorer by his being called away. The years as they passed seemed but to broaden a character that we recall with admiration, and which we must emulate as best we can in dealing with the daily problems which he so satisfactorily met.

(Signed) E. D. Smith,
Enoch Rutzler,
James Curran,
Committee.

The nominating committee presented its selection of candidates for national officers for the coming year, as follows:

President, Stewart A. Jellett, of Philadelphia.

Vice-President, A. E. Kenrick, of Brookline, Mass.

Treasurer, A. N. Chambers, of New York.

Trustees: John D. Hibbard, of Chicago; F. A. Williams, of New York; J. J. Collins, of St. Louis; H. L. Hall, of New York; E. Tunsted, of Minneapolis.

Sergeant-at-Arms, Geo. H. Zellers, of Washington.

On motion the report of the committee was accepted and a ballot resulted in the unanimous election of its candidates.

A GROWING BUSINESS.

The American Distributing Company of Syracuse, N. Y., whose office and warehouse are at 105 West Kennedy street, near South Salina, are doing a steadily increasing jobbing business in plumbers' and steam-fitters' supplies and specialties. Their extensive line embraces low down and high tank closets, plumbers' earthenware, hot water range boilers, enameled and copper lined bath tubs, closet seats and flush pipes, sinks of every description, high and low pressure ball cocks, brass ferrules, compression bath cocks, hot and cold water packings, gasoline torches, plumbers' furnaces and all parts and fittings. They will be pleased to send upon application their most recent catalogue, No. 26, and also their latest discount sheet.

The American Distributing Company is manufacturing and handling a bib seat dresser, bearing the appropriate name "Faultless," which is winning its way wherever it goes. This tool, which should be in the hands of every plumber in the country, is practical and effective in every sense, and can always be depended on to "do the work" and do it accurately. It is made of heavy brass, nickel plated, with removable cutters in four sizes. The revolving shank is encased in a long sleeve, holding the cutter rigid when the funnel is screwed down on top of valve, thereby cutting a true, perfect seat in all sizes of bibs. The "Faultless" bib seat dresser is 4¼ inches high, and can be sent by mail, the postage being only twelve cents. A postal card addressed to the company will procure an illustrated circular with price to the trade. The president of this company is H. Romeyn Smith, who is well known throughout New York and adjoining states for his business capabilities and fair dealing. H. P. Thompson is representative.

COMBINED GARBAGE CREMATORY AND WATER HEATER.

In large cities, in apartment buildings, hotels, etc., the disposal of the garbage is a considerable problem. Another problem that the owners of this style of building have to contend with is the heating of water for domestic supply. One day it occurred to M. J. Cragin, a leading Chicago steam and hot water fitter, that the disposition of garbage could be combined with the heating of water in such a way that the heat arising from the garbage incineration would furnish nearly all the fuel required in heating the water. The result was the construction of the Cragin combined garbage crematory and water heater, of which we show an illustration herewith. The

CORNER CLOSET

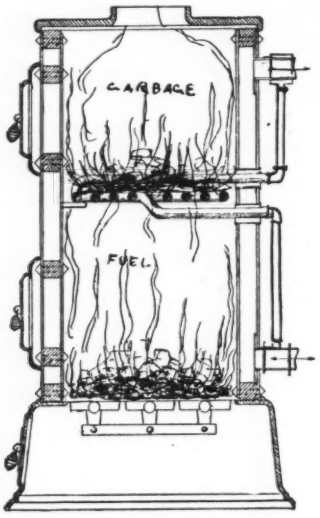
When you want a closet you may want one bad, or you may want one to go in a corner.

The O. K. Manufacturing Company

Ann Arbor Michigan

test of all devices of this kind is actual use, hence we take considerable pleasure in quoting from a number of testimonials of people in Chicago who have used the device.

Samuel Gregsten, of the Windsor-Clifton Hotel Co., says: "You have without a doubt a good device, for it burns all the garbage and heats the water for my hotel at a very small cost for coal."



Chas. F. White, owner of the LaFayette, a 24-apartment building at 66th and Washington Ave., Chicago, says: "The crematory is giving excellent satisfaction. It is very economical in the use of coal and burns the garbage completely, no odor arising from it, and at no time have we been without an abundance of hot water."

Jos. Cormack, owner of an 18-flat building at 65th and Kimbark Ave., says: "I consider it one of the best investments I have made, for it takes less coal to heat the water and burn the garbage both than it takes to run the heater just to heat the water."

N. H. Henderson, M. D., of the Lake Side Hospital, 41-47 Lake Ave., says: "The crematory * * * is giving perfect satisfaction. We are able to burn all the kitchen garbage as well as all the other garbage that accumulates about the building. It burns everything up clean, leaving nothing but a few ashes."

Dr. J. Ramsay Flood, owner of a 33-flat building, says: "I consume about two tons of coal per month, which consumes the garbage and heats the water for 33 flats. I have 33 bath tubs in my building, and at no time have I been without an abundance of hot water for all purposes, including the laundry."

Frank Goedecke, at 5008 Cottage Grove Ave., says: "My coal bill is cut in two, as it only takes about one-half the amount to run your device and before we only heated the water."

This crematory and water heater will do the following work:

1. It will incinerate garbage without odor.
2. It will heat water in less time than any water heater in the world.
3. It will consume less fuel than any heater now in use.
4. It will be the means of keeping homes in a perfect sanitary condition.
5. It will burn all garbage without separating or straining.
6. By the use of this device you save carrying it through the streets, thereby preventing the spread of contagion.
7. It is approved by the Chicago Health Department.

Upon application to the Cragin Combined Crematory and Water Heating Mfg. Co., 285 E. 43rd St., Chicago, Ill., circulars and prices of this very useful device will be sent to the trade or to the architectural profession.

TRADE WANTS.

WANTED—CORRESPONDENCE WITH A competent wet process enameler. Address "H," care of Domestic Engineering, 58-64 N. Jefferson Street, Chicago, Ill. May-June-5-11

WANTED—TRAVELING MEN TO CARRY our line of sanitary specialties as "side line." We only want those who can furnish the most satisfactory references. Address in perfect confidence, 506 care Domestic Engineering, 64 N. Jefferson Street, Chicago. t.f.

TRAVELING MEN, ATTENTION—WE HAVE some taking specialties in the heating line which we desire traveling men to present as "side lines" to the trade. We shall be glad to correspond with those who can furnish satisfactory references. Address, 1882, care Domestic Engineering, 64 N. Jefferson St., Chicago. t.f.

PLUMBERS AND STEAM FITTERS MAKE best agents for specialties in sanitary and heating lines. We desire five hundred plumbers and steam fitters of good repute who can furnish satisfactory references, to act as introducing agents for our specialties to the consuming trade. We pay liberal commission but only desire to do business with those whose reference is satisfactory. Address, 1817, care Domestic Engineering, 64 N Jefferson St., Chicago t.f.

Are you looking for a good heater at a reasonable price that is bound to please your trade and bring new customers? If so, look no further but specify the "Winchester." Experience has taught the trade a "whole lot" and the wise fitter is using "Winchester" on his steam and water contracts. Smith & Thayer Company, Boston, Mass.

Domestic Engineering

Monthly Edition

The leading paper in the world devoted to

Plumbing, Heating, Lighting, Ventilating

JNO. K. ALLEN, . . President and Editor
HERBERT T. SHERRIFF, Assistant Editor
FRANK P. KEENEY . Business Representative

Telephone Monroe 816
58-64 N. Jefferson St. (near West Lake) . . Chicago

ELMER CRAWFORD . . . Eastern Manager
89-91 Centre Street, New York City.

Business Representatives.
New York Office, ... 89-91 Centre St.
Telephone Franklin 1680
ELMER CRAWFORD
FRANK P. TURNER
EDWIN L. MCCULLOCH

In the Field
John R. Keeney. C. M. Carrier.

Mechanical Department
F. Chas. Hill . . . . . Superintendent
Evan H. Sample . . . Foreman Pressroom

Subscription Rates

Monthly edition, two dollars a year, payable in advance; single copies, twenty cents each. Weekly edition, three dollars a year, single copies ten cents.

Advertising Rates

Monthly edition, one inch, forty-five dollars a year. Graded discounts on larger spaces. Guaranteed positions extra. Copy and cuts for advertisements in this edition should be received by the first of month. We cannot guarantee insertions or changes in advertisements if received later than that date.

Entered at the Post-office in Chicago, Illinois, as mail matter of the second class.

Member of the Chicago Trade Press Association.

JUNE 15, 1901.

THE FLUSHOMETER

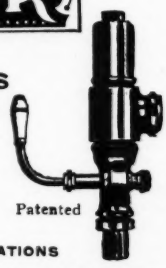
Showing application of Flushometer.

The Kenney System
FOR FLUSHING WATER CLOSETS

The only system that will operate successfully at all times one or any number of closets under the varying conditions of water pressures. NO NOISY AND DIRTY OVERHEAD TANKS. NO CUP LEATHERS OR SPRINGS.

Endorsed by sanitary engineers and plumbers.

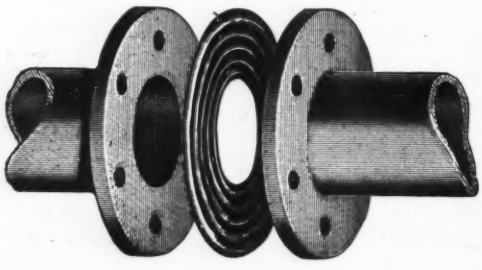
FLUSHOMETER
TRADE MARK



Patented

SEND FOR CATALOGUE AND LIST OF RECENT INSTALLATIONS

THE KENNEY CO., 72-74 Trinity Place, NEW YORK



OUR PATENTED
MINERAL WOOL PIPE COVERING AND COPPER GASKETS

THEY SAVE STEAM AND MAKE ABSOLUTELY TIGHT JOINTS

BEST AND CHEAPEST
SAMPLES FREE

UNITED STATES MINERAL WOOL CO.
143 Liberty Street, NEW YORK.

THOMSON

Meter Company

79 Washington St., Brooklyn, N. Y.

25,145 Water Meters sold in 1899.

26,414 Water Meters sold from January 1st, 1900, to January 1st, 1901.

176,717 Water Meters sold to January 1st, 1901.

We Stamp our Meters only as they are sold.

TRIMO PIPE TOOLS

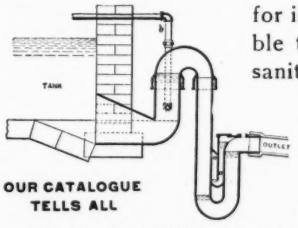
All these tools are drop forged from steel. No others made so strong and durable. No expense spared to make the **best.** Give them a trial and be convinced.

Trimo Pipe Cutter Is convertible from a single wheel with rolls, into a three-wheel cutter, by substituting the two extra cutting wheels that accompany each tool, to be found in the handle, which is provided with a receptacle for same (see cut).

TRIMONT MFG. CO.

SOLD BY ALL JOBBERS. ROXBURY, MASS.

SEWAGE DISPOSAL



OUR CATALOGUE TELLS ALL

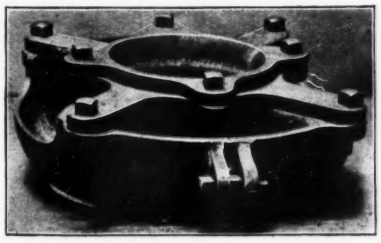
for isolated buildings not accessible to sewer systems, is perfectly sanitary by using our

RHODES-WILLIAMS AUTOMATIC RAN SEWAGE SIPHON

and plumbers make more money by installing plumbing where it could not be used otherwise.

THE FLUSH TANK CO., - AURORA, ILL.

No More Broken Joints



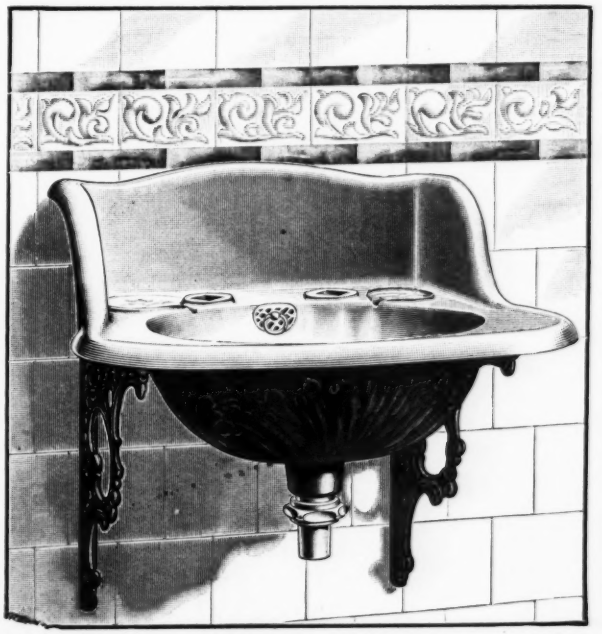
Replaces cement joint between iron soil pipe and earthenware sewer pipe, keeping sewer gas absolutely out. There is no "IF" about it. Our circular free.

GEORGE F. RYAN & COMPANY

3811 COTTAGE GROVE AVE., CHICAGO, ILLINOIS.

One-Piece Iron Porcelain Enameled LAVATORIES

WITH ROLL RIMS AND OVAL BOWLS



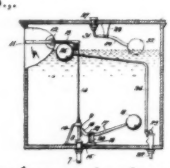
A. Weiskittel & Son, Baltimore, Md.

PATENTS AND INVENTIONS

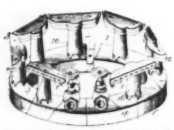
The cuts illustrating patents and inventions in this department of Domestic Engineering are furnished by Oscar A. Michel, Solicitor and Registered Attorney for American and foreign patents, at 302 Broadway, New York City. Anybody desirous of having a patent or invention illustrated will please correspond with Mr. Michel regarding it.

670,931—Thermostat. Charles B. Garrett and William S. W. Blake, Minneapolis, Minn., assignor of one-third to Martin Dyke, same place.

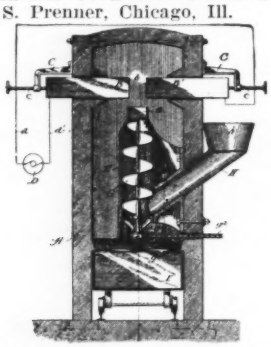
670,934—Flushing apparatus for low-down closets. Ernest C. Mankin, Kansas City, Mo.,.



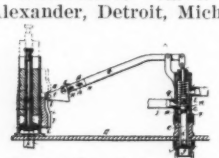
670,979—Gas-burner for furnaces. Chas. F. Allen, Massillon, Ohio, assignor to the Dauntless Burner & Gas Stove Co., same place.



671,008—Apparatus for producing calcium carbid. John Zimmerman and Isedore S. Prenner, Chicago, Ill.

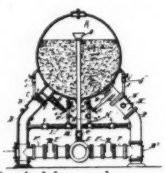


671,123—Water-closet valve. Alexander G. Alexander, Detroit, Mich.

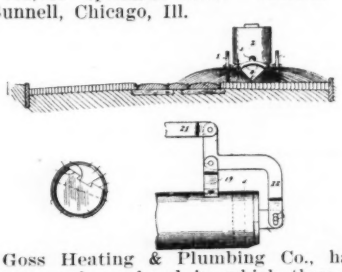


671,143—Wrench. George A. Musselman, Crestline, Ohio.

671,023—Filter. Ira H. Jewell, Chicago, Ill.

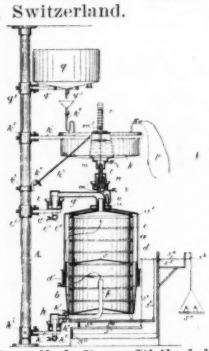


671,045—Sprinkler-valve. Morton G. Bunnell, Chicago, Ill.



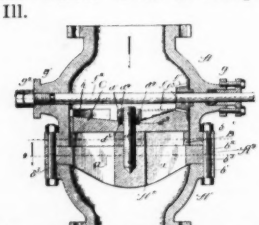
Goss Heating & Plumbing Co., have some work on hand in which they are using Cooper's Reno closets.—Adv.

671,052—Carbureter. Franz K. Kurz, Lucerne, Switzerland.



Wm. Newell & Bro., Philadelphia, have some work on hand in which they are using Cooper's Nautilus closets.—Adv.

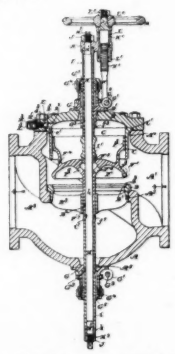
671,142—Valve. John Z. Murphy, Chicago, Ill.



Robt. W. Kyle, Wheeling, W. Va., recently set two of Cooper's filters in Bellaire, O.—Adv.

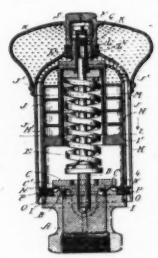
Thomas G. Moore, Philadelphia, is plumbing the residence of Dr. Deane, using Cooper's closets, baths, lavatories, etc.—Advt.

671,149—Balanced valve. Louis Schutte, Philadelphia, Pa.



Geo. Held, Hazleton, Pa., has some work on hand in which he is using Cooper's Nautilus closet.—Adv.

671,523. Safety-Valve. Anton Lohbiller, Boston, Mass.



Myers & Mahoney, Portland, Me., are plumbing a fine residence in that city, using Cooper's Nautilus closet.—Adv.

DYER, EDMONDS & DYER

PATENTS

31 Nassau Street New York City

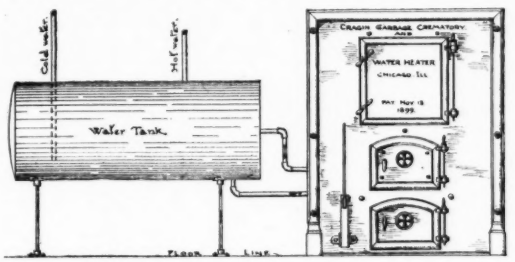
have done all my patent soliciting work for this and foreign countries continuously since 1882

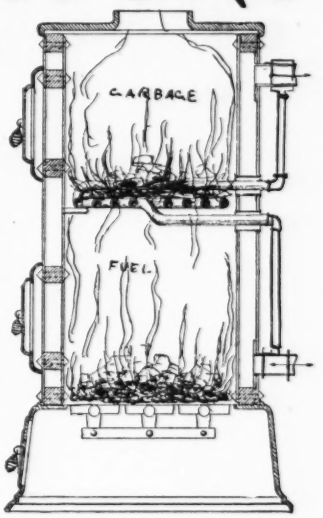
Thomas A Edison

GARBAGE CREMATORY

CRAGIN COMBINED GARBAGE CREMATORY AND HOT WATER HEATER

We have in this crematory and water heater a device that consumes all garbage without the slightest odor and heats water quicker and with less cost than any heater on the market. We make different sizes suitable for residences apartment buildings and hotels. An investigation will convince. They can be found in operation at the following locations:





LOCATIONS OF SOME OF OUR CREMATORIES

Dr. G. M. Chamberlin, 31st St. & Indiana Ave.
C. B. Busch, 5521 Indiana Ave.
M. D. Hull, 49th St. & Woodlawn Ave.
Murray Nelson, Winnetka, Illinois.
A. E. Swanson, Kenmore and Winthrop.
Morris, 49th St. and Prairie Ave.
Alderman Martin, 46th St. & Vincennes Ave.
Thos. G. Otis, 45th St. and Lake Ave.
S. T. Cooper, 46th St. and Indiana Ave.
A. E. Robinson, 5211 Jefferson Ave.
C. W. Hoff, 4323 Grand Boulevard.
E. H. Salsbury, Lincoln Nebraska.

Cragin Garbage Crematory Company

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141 BROADWAY, NEW YORK
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OVER 15 YEARS EXPERIENCE.

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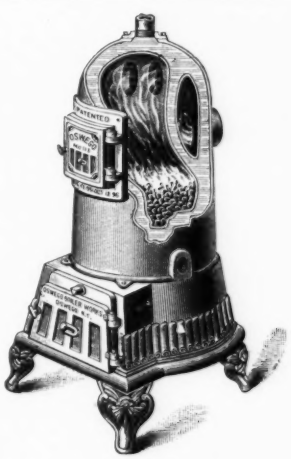
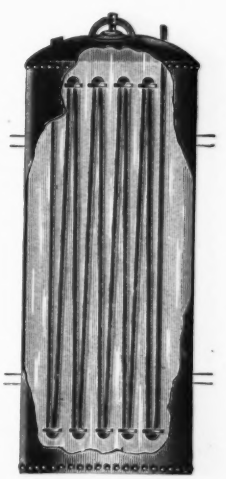


HOUSE HEATERS
TANK HEATERS

Sectional Boilers

Expansion Tanks



Everything you want in the boiler line for low or high pressure.

OSWEGO BOILER WORKS
OSWEGO, N. Y.

APPOINTED SALES AGENTS IN THIS TERRITORY.

Warren, Webster & Co., of Camden, N. J., manufacturers and operators of the Webster system of steam heating, have appointed the American Engineering Specialty Company, of Chicago, their sale agents for all specialties manufactured by them in the following territory, viz.: Illinois, Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Ohio, Michigan, Indiana, Iowa, Texas, Kansas, Alabama, Mississippi, Arkansas and Oklahoma and Indian Territory.

There will be no change in the policy of handling the Webster system and Webster devices. The same branch offices will be maintained, with additional ones to meet demands.

A. L. Boorse, Bustleton, Pa., has the contract for plumbing a building in which he is using Cooper's goods throughout.—Advt.

THE NOPPEL PUMP.

Here is a little pump which certainly is useful to every plumber in the United States. It will remove obstructions from pipes without any trouble. It is a combined lift, force, discharge and test pump, and air, liquid or gas can be forced into the pipes with a constantly

increasing pressure without any alterations in the fittings, and it can be instantly changed from a force to a suction pump and will continue to exhaust air or draw out and discharge water and loose material until the pipes are empty. It is indestructible, simple in construction and is easily operated. Upon application, mentioning "Domestic Engineering," the Noppel Pump Co., P. O. Box 1084, Hartford, Conn., will send circulars.

Richard Ormrod, Philadelphia, is plumbing a West Philadelphia residence, using Cooper's baths and lavatories.—Advt.

THE DESPER SPECIALTIES.

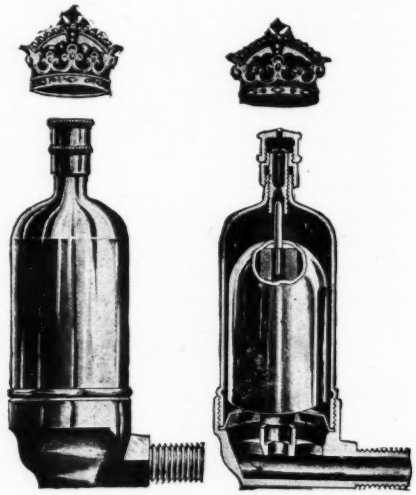
Henry A. Desper, of Worcester, Mass., makes some specially good things for master plumbers, of which we may mention the soil pipe testing valve, which we show herewith. It is a specially good thing and plumbers ought to get in communication with Mr. Desper and get cir-

culars describing this as well as his other specialties. His "Balsago" cement is a good thing for soil pipe. It saves many broken hubs. And then he has another good thing in his bracket ring for range boilers, which supports the range boiler, leaving a clear floor space. Mr. Desper is an ingenious man who is passing his ingenuity on in chunks to the retail trade, who should write and get his printed matter, mentioning "Domestic Engineering."

THE "ROYAL" AIR VALVE.

Pierce, Butler & Pierce Mfg. Co., of Syracuse, N. Y., are putting on the market a new automatic air valve which we take pleasure in showing herewith in exterior and sectional views.

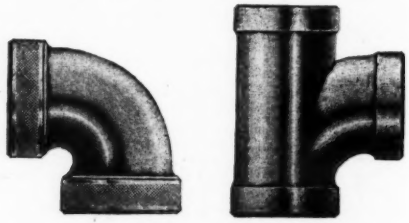
This valve will be known as the "Royal 1900." It is a ball joint syphon float valve, so constructed as to automatically open to allow the escape of cold air but to close against water by flotation and steam by expansion. The patent ball



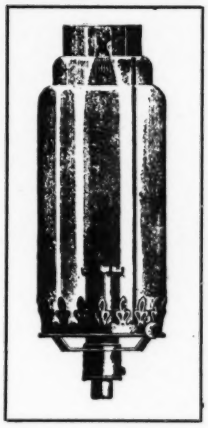
joint makes a perfectly tight joint and prevents leakage. The deflector prevents excessive air pressure from raising the float and prematurely closing the valve. With this improved construction a syphon is formed in the base which allows the water of condensation to leave the valve quickly and return to the radiator the instant the valve closes. This enables the valve to free a large radiator from air much quicker than the best makes of ordinary valves. The expansion rod is very sensitive, operates quickly and will last a lifetime. The valves are all made of the best workmanship and material and are fully guaranteed. They have just issued a new booklet which they will send gladly on application.

FINE THREAD TUBE FITTINGS.

The Speakman Supply & Pipe Co., of Wilmington, Del., make a complete line of fine thread tube fittings, of which we show two styles herewith. These are



made especially attractive and their prices are given in their new catalogue D just out, which they will be glad to send you upon application, mentioning "Domestic Engineering."



Acetylene Mantle Burner

The only mantle burner on the market using Acetylene Gas.
Made in four sizes, as follows:

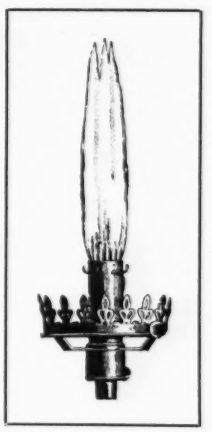
Burning 1 foot per hour -	1,000 C. P.	Burning ¼ foot per hour -	250 C. P.
Burning ½ foot per hour -	500 C. P.	Burning ⅛ foot per hour -	125 C. P.

Special Mantles are made for Acetylene Gas. They are more durable and last much longer than the ordinary mantle. This burner will not carbonize or clog. It will increase the sale of Acetylene Gas Generators 500 per cent. By using the mantle Acetylene Gas will cost but one-quarter as much as from the burner now used.

WRITE FOR CIRCULARS AND PRICES

Atlantic Acetylene Burner Company

179 SUMMER STREET, BOSTON, MASS.



Utility Ratchet Chain Drill

Not every man can afford to have every tool offered him. He must discriminate, and choose those which will do the most work. Designed to do heavy work, such as structural iron work, pipes, columns, etc.

Operates either by ratchet or continuous rotary movement of handle.

Frame is made with notches, in which chains may be engaged at any point. Ball thrust bearing reduces friction. Polished parts are nickeled.

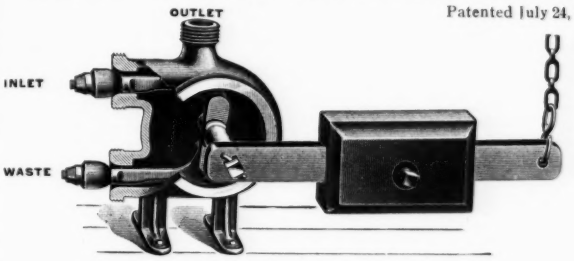
Weight 6½ lbs.; takes ½ inch shank of drill or larger.
We have other good tools, too. Write for Circulars.

DUFF MACHINE CO.

LOWELL, MASS.

ASBELL'S
FROST PROOF HOPPER VALVE

Patented July 24, 1900



Made of best brass, has no pins or screws to work loose, or spring to get weak and break; most durable and most compact valve on the market; can be operated by chain or iron rod with seat; closes with the water pressure—when closed there is no pressure on the stuffing box—an adjustable weight regulating it to suit the amount of pressure. The only washers used on inlet and waste are two fuller balls, the top of which governs the supply and the bottom the waste; when in operation the waste is perfectly tight, so as to give closet full flow of water. From the cut it will be seen that the valve is so constructed and arranged that not a particle of water will remain in the valve casing after the flushing of the closet, having a waste the same size as the supply, therefore making it quick wasting and *frost proof*. They are made for lead pipe, and ½ inch iron pipe without extra charge. Also for ¾ inch iron pipe for after flush closets, where air compressed tanks are used. If the latter is desired so state, and add 50 cents to the list.

The S. J. Asbell Company, Paterson, N. J.

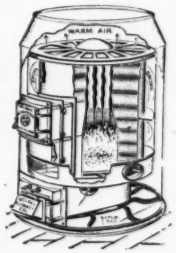
BROOMELL'S VAPOR SYSTEM

Adapted to the heating of buildings of any kind and size. Has all the advantages of Hot Water without its objectionable features.

Absolutely Noiseless. No Pressure. No Air Valves. No Pumps nor Machinery. Heat under Perfect Control. Send for Catalog.

Installed by all steamfitters. Superior to any other system of heating.

VAPOR HEATING CO., YORK, PA.



The very best heater in the World is the

Kelsey Warm Air Generator

Steady heat — Economy of fuel — Gas tight—Dustless—Smoke proof—Hygienic —If you don't handle furnaces write us and see what we will do for you.

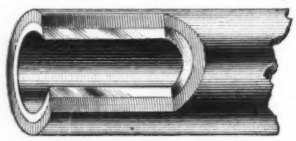
THE KELSEY FURNACE CO.

SYRACUSE, N. Y.

Scott & O'Day, Lowell, Mass., are remodelling the plumbing in a residence in that city, using Cooper's Nautilus closet.—Advt.

THE L. & R. PATENT PIPE.

We show an illustration of the construction of the L. & R. tin lined iron pipe which, when used, absolutely guarantees pure water. It is cheaper than brass pipe, almost as cheap as lead pipe and is safe against brass or lead poison-



ing. It is solid and the lining cannot be separated from the pipe either by bending or the creeping action of hot water. They also make lead-lined iron pipe in the same way. Lamb & Ritchie, of Cambridgeport, Mass., will give you full particulars of this pipe if you write them, mentioning "Domestic Engineering."

Mulligan & Schermerhorn, Troy, have some nice work on hand in which Cooper's Nautilus closets are being used.—Advt.

THE ABNER GIANT GENERATOR.

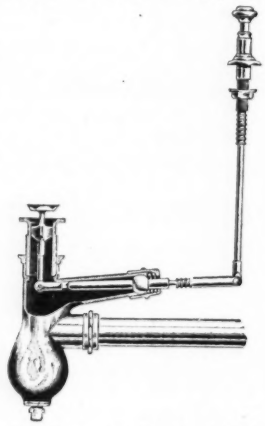
We show herewith the Abner Giant acetylene gas generator of unlimited capacity for village, town and city lighting, as made by the Abner Acetylene Gas Co., 34-36 La Salle street, Chicago. It is made throughout of heavy galvanized iron, with riveted and soldered joints, brass castings and brass rod connections. It consists of a carbide hopper feed chamber with residuum discharge device; a purifying and expansive chamber; a gas holder chamber with water seal and a purifier and dryer. The water supply is furnished automatically from a small water tank with float valve regulator. Although it is constructed in small dimensions, it possesses a very large generating capacity. The Abner machine is one which plumbers and machine fitters can recommend and install. It is also made in smaller sizes for from ten lights up to 50 lights. The Giant generators illustrated herewith are made for from 50 to 2,000 lights. Upon application to the manufacturers you can secure printed matter with more complete description of these interesting generators.

Plumber Bowker, Atlantic City, is doing the work in a large apartment house, using Cooper's brass work throughout.—Advt.

John Getz's Sons, York, Pa., are remodelling the plumbing in a residence in that city, using Cooper's goods.—Advt.

THE PURITY WASTE.

The H. M. Weaver Co., of Mansfield, O., manufacture this Purity bath and basin waste which cuts off the water in the bowl or bath from direct contact with the filth in the outlet pipe. It opens

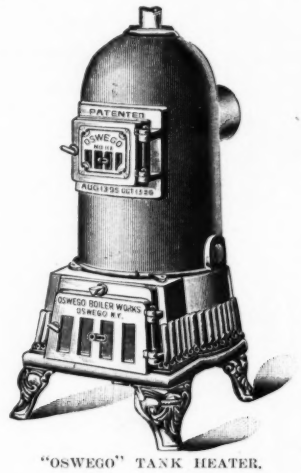


or closes with a touch, is simple in its construction and has no parts to get out of order. Upon application to the manufacturers a beautifully printed catalogue showing the application of this waste to lavatories and baths will be sent, if you mention "Domestic Engineering."

W. J. McGuire & Co., Toronto, are plumbing a residence in that city, using Cooper's Nautilus closets.—Advt.

HEATERS FOR THE WORLD.

There are few concerns in the country who manufacture and carry in stock as large and complete a line of steam and hot water heating apparatus as the Oswego Boiler Works, of Oswego, N. Y. Their output embraces a great variety in style and size of house heaters, tank heaters, sectional boilers and expansion tanks, as well as high pressure boilers, upright and horizontal. They make no less than sixty sizes of house heaters, ranging from 100 to 6,000 square feet radiation and their tank heaters range in capacity from 100 to 1,000 gallons. They also manufacture tanks of every description.



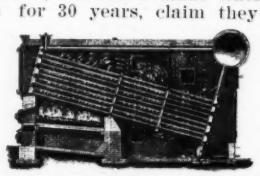
"OSWEGO" TANK HEATER.

The series of tank heaters, 011 to 015, is intended to meet a growing demand for an economical arrangement for heating water for barber shops, bath rooms, boarding houses, small hotels, stables and conservatories; and series 111 to 122 is specially adapted for small heating systems, and heating large quantities of water for hotels, apartment houses, offices, baptistries, laundries, etc. They are all equipped with the celebrated Dock ash grate. A line to the Oswego Boiler Works, Oswego, N. Y., mentioning "Domestic Engineering," will bring a set of handsome blotters which they are issuing to the trade. This firm's New York office is at 39 Cortlandt street, where they do a large business in Greater New York and throughout the eastern section generally. They not long ago opened a branch office at 6 and 8 North 6th street, Philadelphia.

Philip McGivney, Newburgh, N. Y., has some alteration work on hand in which Cooper's goods is being used.—Advt.

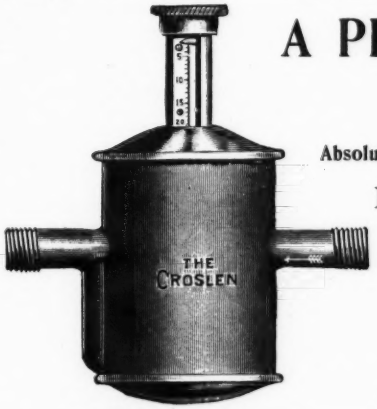
THE IDEAL BOILER.

The Ideal Heating Co., of Oskaloosa, Ia., make the Phelps Ideal boiler, which we illustrate herewith. It is of the water tube type and everyone who knows anything about boilers knows that the type is an everlasting good one. Garth & Co., of Montreal, who have made water tube heaters for 30 years, claim they have

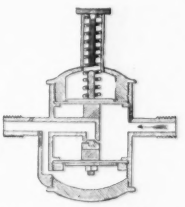


boilers 30 years old which are still in use. The Ideal Heating Co. have some of their boilers which have been in use nine years and are good, and they claim that is a very good recommendation for their type of heater. It is made for hot water or steam and is a boiler which will appeal to agents wherever they are located. They are looking for good representatives and will send literature free upon application, mentioning "Domestic Engineering."

F. T. Burgess, West Newton, Mass., are plumbing a residence in that city, using Cooper's closets, baths, lavatories, etc.—Advt.



A PRESSURE REGULATOR THAT CANNOT LEAK



Absolutely no friction. **No Stuffing Boxes** **No Sliding Parts or Packings**

High pressure balances itself. Pressure of spring opens valve. When back pressure in low pressure chamber balances the spring, valve closes. **Made for Air, Gas, Steam or Water.**

CROSLEN MFG. CO.

119-121 La Salle St., **CHICAGO, ILL.**

State size and amount of

WROUGHT PIPE

wanted and we will quote extremely low prices. We carry over 1200 tons in stock. **F. K. BOWES & CO.,** 1605 Great Northern Bldg Chicago

The Duffy "No-Flud" Back Water Stop

STOPS THE WATER BACKING UP through basement and Area Drains and prevents foul gases arising from the sewer. No Erratic Rubber Balls or swinging metal Gates which are unseated by Sediment, Paper or Matches.

IT NEVER DISAPPOINTS

For Sale by the plumbing trade generally. Made by

E. S. DUFFY MANUFACTURING CO.

Not Incorporated. **6438 Wentworth Ave., Chicago**

INVENTION FOR SALE

ALTPETER'S ALUMINUM SOLDER

Hard and Soft Solder, also a process to solder copper, brass and other metals to aluminum

Samples shown. No solder for sale

758 S. Halsted St.

CHICAGO

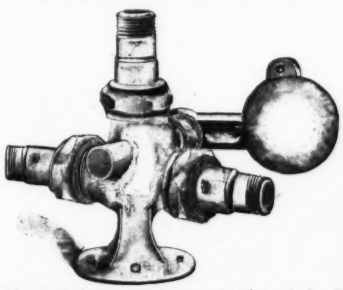
L. F. ALTPETER, JEWELER

DOMESTIC ENGINEERING

IS THE LEADING TRADE JOURNAL DEVOTED TO PLUMBING, HEATING, LIGHTING AND VENTILATING.

Star Hopper Valve

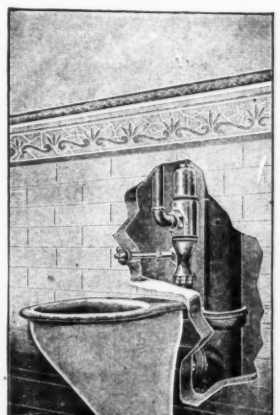
GET THE BEST, IT'S THE CHEAPEST



The above cut is an exact representation of the Star Hopper Valve, which we claim possesses more desirable points than any other Valve on the market. It wastes absolutely no water, the one straight stem setting firmly with solid ball on inlet end and hollow ball on waste end, is controlled by key stem or rock shaft to which the lever is attached. The action of this ball stem is in a straight horizontal movement and the fittings are so snug that rattling is impossible. The Valve closes with the pressure and is not effected by any variation in same. This hollow ball on the waste end of stem travels two-thirds of the stroke with the port closed, takes up any slack that might occur in seat chain, thereby preventing any waste of water passing through the soil pipe. The Star Hopper Valve was tested for two years by the Metropolitan Water Company, of Kansas City, Mo., and found to use no more water than a tank closed, it was then adapted and rated as a tank closed. The Star Hopper Valve is the most durable Valve on the market and will not require fifty cents for repairs in five years.

Crampton-Farley Brass Company

KANSAS CITY, MO.



National Enameled Iron Jail Closet

Simple, durable and easily adjusted. No overhead tanks required. Cannot be tampered with—no movable parts being exposed.

MANUFACTURED BY

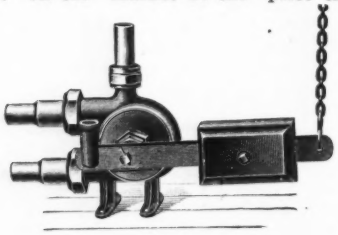
The National Supply Company

TOLEDO, OHIO

J. H. Nagle, Cambridge, Mass., has some work on hand in which he is using Cooper's goods.—Advt.

Success Assured.

The S. J. Asbell Co., of Paterson, N. J., are more than pleased with the success they are meeting with in introducing their frost proof hopper valve. All the jobbers that are handling them report good sales, which indicates they are a go with the plumbers wherever they have been seen. This valve is made of the best brass and has no screws to work loose or springs to weaken and break. It is a strong, simple and compact valve put on the market at the price that

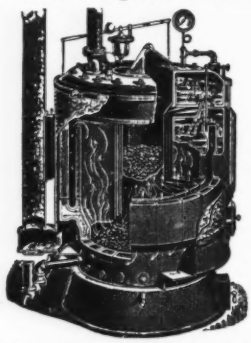


makes them sell readily. They can be operated by rod or chain action with seat and also used with air compressed tank for after flush closets. The only washers used are two Fuller balls. Not a particle of water will remain in the valve casing after the flushing of the closet, making it quick wasting and frost proof. They are furnished for lead or iron pipe. They are also manufacturing large quantities of die plugs, brass swing joints, as well as a full line of beer pumps, faucets, air pumps, double action pumps, etc.

F. W. Gleason & Co., Hyde Park, Mass., recently set some of Cooper's fixtures in an operation he has in that city.—Advt.

The Roberts Boiler.

Here is a boiler which is economical and is easily managed. It is claimed to reduce the loss unutilized fuel to a minimum. It is believed by the manufacturers that steam and hot water fitters who use this boiler will get other orders from



every job installed and they so hold out the hope to their customers. This is not a very large illustration. It does not show the boiler as well as the catalogue, which will be sent upon application, if you write to the manufacturers, the Robers Machine Co., of Collegeville, Pa., mentioning "Domestic Engineering."

Twentieth Century Catalogue on Way.

Ronalds & Taylor will soon be ready to fill all applications for their Twentieth Century catalogue of plumbers' materials, etc. The book is now in the printer's hands and will probably be ready for delivery within ten days or two weeks. By mentioning "Domestic Engineering" and getting your order in early you will be sure of getting one. They are at 52 Cliff street.

Visit Atlas Pipe Wrench Exhibit.

Every reader of "Domestic Engineering" is advised, if intending to attend the Pan-American Exposition, at Buffalo, to visit the exhibit of the Atlas Pipe Wrench Company.

The Atlas company's exhibit is in charge of one of the company's best men. The exhibit is complete in every way, and all visiting it will find a hearty

welcome. An expert workman is always present to give a practical demonstration of the Atlas wrench. Circulars illustrated and setting forth the merits of the wrench will be given anyone upon application.

The Atlas, it is claimed, is made from the best of materials. The quality of the steel used and the finish and workmanship will be shown in wrenches in their various stages of manufacture, from the bar steel to the finished product.

The teeth of the Atlas wrench grip the pipe at an angle. The gripping point is in advance of the handle, showing that in screwing a pipe the wrench is pushed ahead, consequently the teeth do not dig into the pipe and drag it, nor is the pipe crushed. For the same reason, it is claimed the Atlas wrench cannot lock on the pipe at the gripping point.

The New York office of the Atlas Pipe Wrench Company is at 121 Liberty street. Its San Francisco office is room 51 Flood building, and its factory is at New Haven, Conn.

Mention "Domestic Engineering" when writing for circulars.

Quick Water Heaters

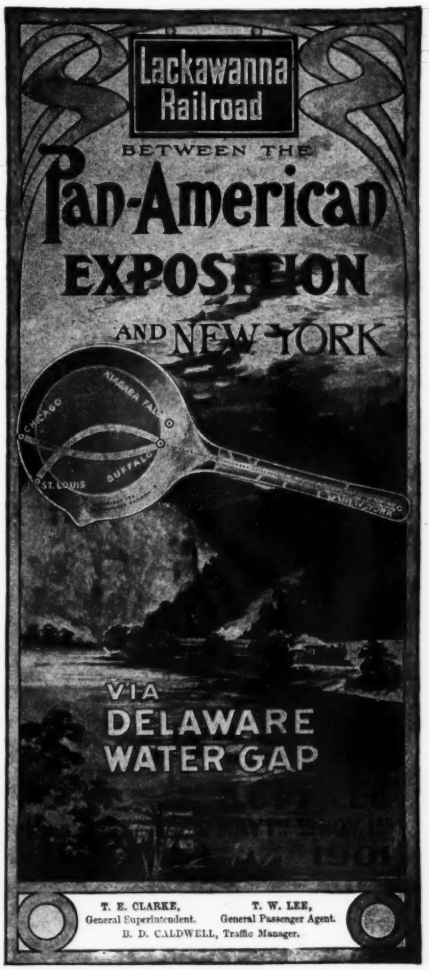
Not Quite Instantaneous

Price, $12.00 to $18.00

Large size has 8 square ft. heating surface

J. S. EMERY

1114 S. 15th Street TOLEDO, OHIO

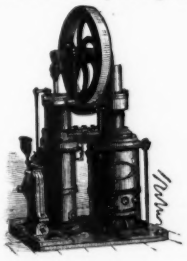


This is a reproduction of the cover of a complete guide to the Pan-American Exposition just issued by the LACKAWANNA RAILROAD. It will be mailed to any address on application, accompanied by four cents in stamps, to

T. W. LEE,
General Passenger Agent,
26 Exchange Place,
NEW YORK CITY.

HOT AIR PUMPING ENGINES

There are only two good Hot Air Pumping Engines which have stood the test of time. They are the



Rider and the Ericsson Engines

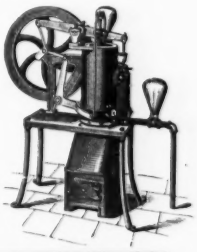
There is only one concern that has stood the test of time, and that is

The Rider-Erricsson Engine Co.

Every improvement suggested by our wide experience has been adopted. Send for Catalogue "A" to nearest office.

RIDER-ERICSSON ENGINE CO.

22 Cortlandt St., New York 40 Dearborn St., Chicago
239 Franklin St., Boston 40 N. 7th St., Philadelphia
692 Craig St., Montreal, P. Q.



Eminent chemists testify that our Water Filters are germ proof. No chemicals used; Filters can be thoroughly cleansed without removing any part.....
....Results guaranteed....

CAPACITY 10 to 10,000 gals. per hr.

Hundreds of our customers have furnished voluntary testimonials.

LIBERAL DISCOUNTS TO PLUMBERS.

Catalogue Mailed on Application.

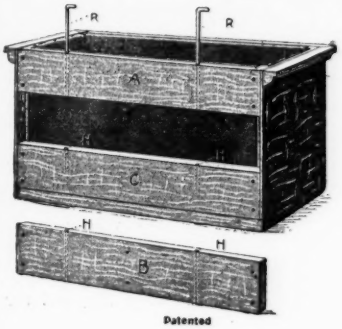
WM. B. SCAIFE & SONS,
PITTSBURGA, PA.

DOMESTIC ENGINEERING

THE LEADING JOURNAL OF ITS CLASS

A New Tank for the 20th Century

THE "EASY PUT UP"
(PATENTED)



Patented

NO BRACKETS TO RUST.
SAVES TIME & LABOR.
MORE SECURE WHEN UP.
EASILY & QUICKLY TAKEN DOWN.

For descriptive Circular and Prices address

William Heap, Plumbers' Woodwork Manufacturer,
MUSKEGON, MICH.

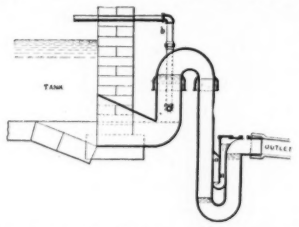
JUST WHAT THE PLUMBER IS LOOKING FOR.

TO MASTER PLUMBERS:

If your Jobber does not handle this Tank, drop us a postal card and we will tell you who does.

A New Water Closet.

The illustration shown herewith is of the "Dececo" Colonial washdown siphon closet. It is really new. In principle and action it is radically different from all other siphon closets, there being no deflector or contractions of any kind in its discharging limb. Although the entire flush enters the flushing rim, there being no jet, it has the most powerful siphonic action yet produced in a closet, and it is claimed it will do double the work of the ordinary siphon jet with about one-half the amount of water. It does not depend on any head or force to the flush and works perfectly with a low down tank with a 1½-inch siphon valve and 1½-inch supply to the closet. It is



claimed to be the only closet made that will work under these conditions. Although this closet has been on the market but a short time, its sales have been phenomenal, and it is today being used in the best class of work in preference to the siphon jet closet. A catalogue, giving complete description and prices of this closet, will be sent upon application to the Dececo Co., No. 146 High street, Boston, Mass.

Myers & Mahoney, Portland, Maine, are setting Cooper's Nautilus closets in a residence in that city.—Advt.

The Disposal of Sewage.

The Flush Tank Co., of Aurora, Ill., manufacture the Rhodes-Williams automatic raw sewage siphon for the disposal of sewage in isolated places not accessible to public sewers. We have had many inquiries from our readers for such an article and we illustrate it herewith. It discharges automatically from a tank or chamber the accumulated sewage into a surface or subsurface drain. When sewage is delivered into porous absorption drains it soaks away into the ground which is sufficiently penetrated by the air to facilitate oxidation. When the sewage is delivered over the ground the exposure to the air is more complete and oxidation is more rapid. The flush tank may be placed in any position and any distance from the house and the field for the disposition of sewage may be at any distance from the flush tank. The master plumbers who can induce clients to use this system can obtain a great deal of business which they would never get in any other way, as it solves the problem for sewage disposal for isolated houses.

W. P. Cook, Philadelphia, has some nice work on hand, in which he is using Cooper's Sitz bath and other goods.—Advt.

R. H. Watson, Philadelphia, is plumbing the country place of Mr. R. D. Wood, using Cooper's baths.—Advt.

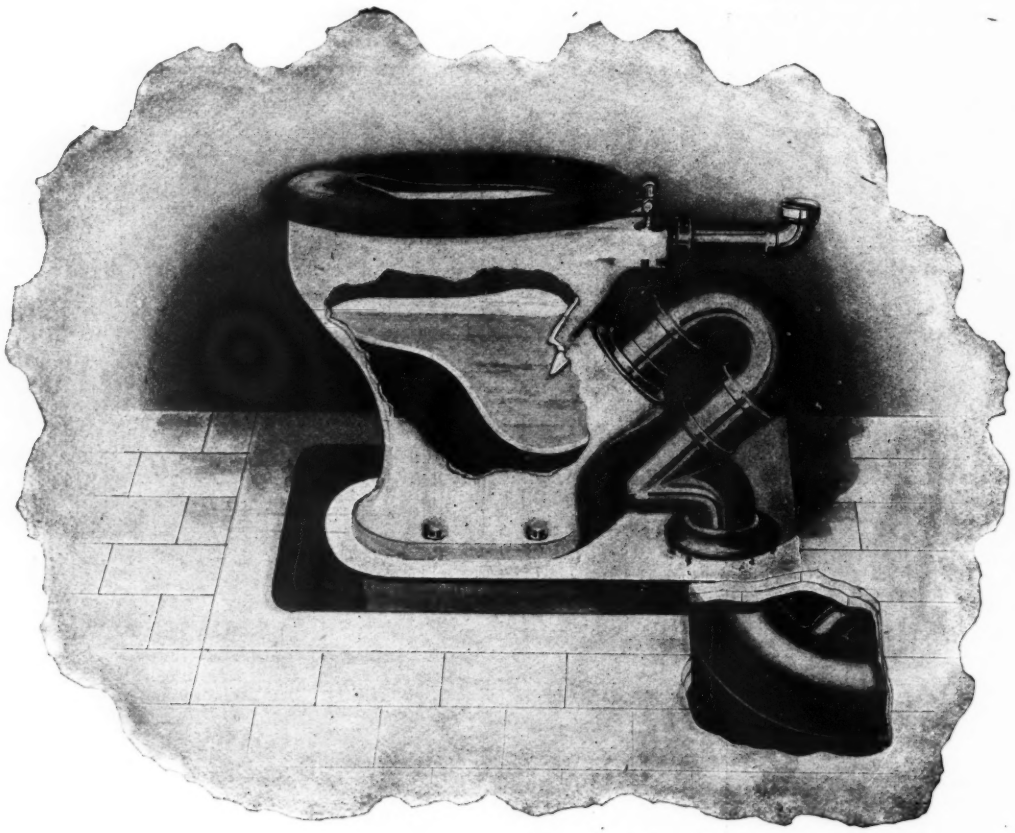
The Excelsior House Trap.

Sproul & McGurrin, leading plumbers in northern Michigan, at Grand Rapids, Mich., manufacture this Excelsior house trap which we advise our readers to get acquainted with. It is made in two sizes, for large work and residence work. List price and trade discount will show its

advantages, and these can be secured by writing them, mentioning "Domestic Engineering."

B. P. Spear & Co., Boston, have some alteration work on hand in which they are using Cooper's Nautilus closets.—Advt.

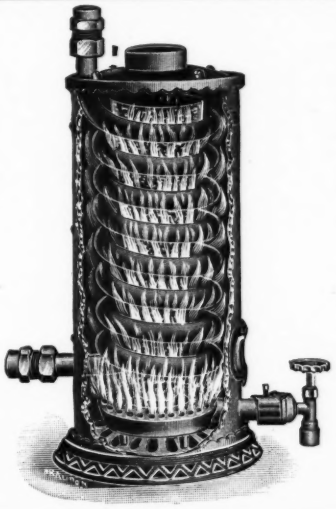
Ben Olsen, Tacoma, Wash., has some fine work on hand in which he is using Cooper's closets.—Advt.



The Screw Ferrule.

The illustration we show herewith is of an iron body brass screw trap screw ferrule with a brass cover. The projections on each side prevent the ferrule turning

after being calked. This is a very clever device. They are made from two to six inches in size by A. Harvey's Sons Mfg. Co., Ltd., Detroit, Mich., who will be glad to send circular upon application, mentioning "Domestic Engineering."



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GAS - - WATER
HEATER

PRICES WILL SUPRISE YOU

L. S. LAWSON

222 Eighth Avenue, Homestead, Pa.

OAKUM PACKING AND ROPE

Planet Mills Mfg. Co.

335 Carroll St. BROOKLYN, N. Y.

"TOTAL ECLIPSE"

Hydrants and Street Washers

The cheapest and most durable on the market.

Guaranteed to give entire satisfaction

We also make all styles of "McNAMARA" PATTERN HYDRANTS

Carried in stock by all Jobbers

WRITE YOUR DEALER FOR PRICES

JOHN G. KUPFERLE
ST. LOUIS

M'VAY & WALKER R.
Manufacturers of Enameled Tubs.

WILL GLADLY SEND PRICES ON THE TWO BEST TUBS MADE.

Write Today. *Unique and Eureka* Prices will surprise you.

BRADDOCK, PA.

GET THE LATEST

and best Low Down Closet Combination on the market

The Adonis

Write for advance sheets showing

FINE BATH ROOM FIXTURES AND SANITARY SPECIALTIES

Manufactured by

The Western Brass Mfg. Co.

615-617 Walnut Street, ST. LOUIS, Mo.

THE DENNY HOT AIR PUMPING ENGINE.

We show herewith the Denny improved Ericsson hot air pumping engine, as built by the American Machine Co., of Wilmington, Del. It is of modern design, the cranks, links, etc., being all double, one for each side. The pivots and bearings are not subjected to any side or twisting strains. The whole machine is mounted on a cast iron base plate which has a rigid construction, making the machine operate easily, uniformly and almost noiselessly. The parts requiring adjustment are accessible and can be detached without disturbing the other parts of the engine. There are double bearings for the air piston links, double main beam, two connecting rods, adjustable boxes for bell crank links and connecting rods, the fly wheel shaft running in two double boxes, two bell cranks with counter weights to balance transfer piston, which maintains a uniform speed at all points of the stroke. The furnace is built

of cast iron in two longitudinal sections, lined with fire brick and suitable for any kind of fuel without change. It has lampwick packing, so that it is not necessary to send to the manufacturers to repack.

"The Ericsson engine operate on the same principle as the Rider. It has but one cylinder, in which is arranged two pistons, the upper one called the air or power piston, which receives and transmits the power, and the lower one called the transfer piston, by means of which the air is transferred from one end of the cylinder to the other, alternately. The lower end of the cylinder extends into the furnace, in which is generated the necessary heat for operating the engine. The upper end is provided with a water jacket, by which means it is kept cool. The proper reciprocating motions between the two pistons are maintained by an ingenious mechanical arrangement.

"After starting the fire and raising the temperature in the heater pot to the proper degree, which usually requires only a few minutes, it is necessary to turn the fly wheel a few revolutions by hand in order to start the engine. The downward stroke of the air piston compresses the cold air in the cylinder, when it is transferred by the transfer piston to the lower end of the cylinder, where, owing to the very efficient method of heating the compressed air, the expansive force due to the sudden raise in temperature drives the power piston to the end of its stroke, where it is cooled and again compressed, the same air being transferred from one end of the cylinder to the other and alternately compressed and heated and expanded and cooled."

It would be well to send to the manufacturers for their complete catalogue, which will be sent if you mention "Domestic Engineering."

E. Bevan & Co., Philadelphia, are plumbing the new and elegant residence of Mr. Nathanson on North Broad street, using Cooper's closets, baths, lavatories, showers, etc.—Advt.

A CHARMING PICTURE.

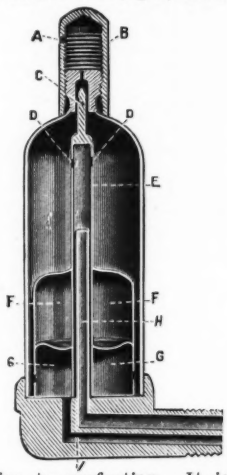
The William M. Crane Company, of New York, present their Vulcan gas range to the public in pleasing fashion by showing the range in operation and presided over by a charming young lady who smiles sweetly as she stands over the stove. It doesn't take much of an imagination to infer that her good nature is due to the ease and comfort of using one of the company's gas ranges in contradistinction to the general discomfort of cooking day when the old time coal or wood range is used.

J. H. Sullivan, Newton Centre, Mass., is remodelling the plumbing in a residence in that city, using Cooper's closets, baths and other goods.—Advt.

F. J. McGarry & Bro., Philadelphia, have some nice work on hand in which they are using Cooper's baths.—Advt.

THE ARGON VALVE.

This is an air valve made by the Argon Mfg. Co., Denver, Colo., and is said to be equally efficient on steam or hot water radiators. The manufacturers make unusual claims for this valve and say that it is tested for air, gas, steam and



water service to perfection. It is said that they do not need adjustment, which is an important feature in a valve. We should be glad if those interested in the purchase of valves would write to the manufacturers and ask for prices, which will be sent upon application.

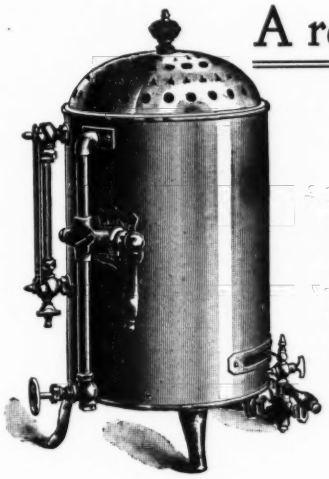
Herman H. Russ & Sons, Albany, N. Y., have some fine work on hand in which they are using Cooper's Nautilus closets. —Advt.

SANITARY EARTHENWARE.

The Bellmark Pottery Co., Trenton, N. J., P. O. Box 547, make this improved washdown closet. Its wall is one inch thick, giving it unusual strength and reducing the liability of breakage to a minimum. This makes the closet adapted for use in public places, such as schools, court houses, etc., where the closets are

subjected to hard usage. It is intended to take the place of imported or domestic fireclay closets and is constructed of a hard vitreous china body which is guaranteed against crazing. The same quality of goods could be furnished with siphonic action or siphon jet, and the company would be glad to get in correspondence with you.

M. J. Gibbons, Dayton, Ohio, is using Cooper's Nautilus closet in a fine contract that he has on hand.—Advt.



A record breaker

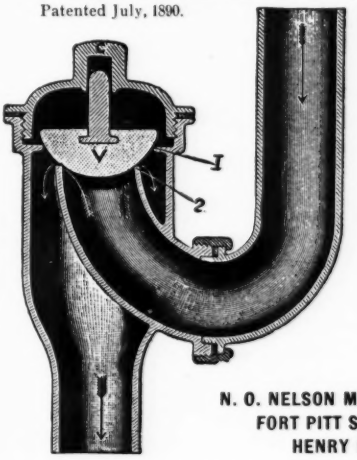
Boils water in
1½ minutes

This heater with gas attachments for heating water to a high temperature with unequalled rapidity and economy cannot be surpassed by any heater on the market. Adapted for bath rooms, etc. Send for catalog.

Challenge Mfg. Co.
South Norwalk, Conn.

THE SECURITY TRAP

Patented July, 1890.



Seal: Cannot be reduced in any degree by most severe syphonic action.

Evaporation: Ball rests in such a way that it is impossible for water to evaporate.

Back pressure: Positively safe against it.

Noise: No roaring.

GET PRICES.

WM. A. MUNDY
211 S. Ninth St.
PHILADELPHIA, PA.

N. O. NELSON MFG. CO., St. Louis, Mo.
FORT PITT SUPPLY CO., Pittsburg, Pa.
HENRY McSHANE MFG. CO., Boston.

Fig. 52

House Force Pumps

FOR KITCHEN SINK USE.

These pumps are adapted to a variety of purposes and are constructed as a compact, yet powerful hand force pump, especially intended for house use in forcing water into an upper story or storage tank. Made with polished iron, brass lined or all brass cylinder.

Fig. 53 is also furnished with brass tube cylinder, cylinder cock spout, brass piston rod, and stuffing nut highly polished and nickel plated, making one of the handsomest pumps ever put on the market

A. Y. McDonald & Morrison Mfg. Co.

Established 1856 DUBUQUE, IOWA

Fig. 53

Here's an "Eye Catcher"

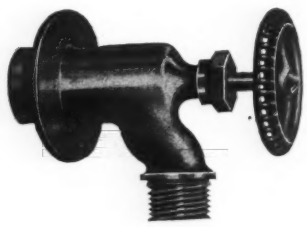
IT'S A CUT—one of the sort of illustrations we are making every day for advertisements, booklets, catalogues, etc. We make them in half-tone or line, from photographs, drawings, or direct from the articles. We have a plant and a force that give our customers great advantages in quality, time and cost.

Send for Specimens and Prices.

The Standard Engraving Company
Incorporated
Seventh and Chestnut Streets, Philadelphia, Pa.

THE HAYS BRASS GOODS.

"Circumstantial evidence should not be trusted too far," as the doctor said when the little girl told him she had chicken-pox because she had found a feather in the bed, but there is circumstantial evidence that may be depended upon; style, finish, material, are not circumstantial evidences. They are positive evidences which can be seen, felt and handled, and



they would guarantee the line of brass and iron goods made by the Hays Mfg. Co., Erie, Pa., to be good and reliable, if no other evidence was needed. But there is a mass of circumstantial evidence in that these goods are used by hundreds of master plumbers and steam fitters all over the country who desire specially to use only the very best. Hays' goods can be depended upon. Write and get a catalogue, and in doing so mention "Domestic Engineering."

Chas. G. Hanchett, Syracuse, N. Y., has some work on hand in which Cooper's closet is being used.—Advt.

THE GEM.

Here is a good type of steam and hot water heater, easily and quickly set up, with capacity guaranteed. It is a type which is greatly liked in this market and fitters should get acquainted with the price, which is right. It is made by Abendroth Bros., Port Chester, N. Y. The agents in Philadelphia are Crane Co.,

and in Chicago the Western Valve Co. If you write for an illustrated catalogue, you will also see shown the vertical steam and water boilers made by the same firm. All these goods are thoroughly reliable and can be depended upon.

The Nautilus closets made by Wm. S. Cooper's Brass Works seem to be highly appreciated on the continent of Europe. Another large shipment of these goods was made to Germany.—Advt.

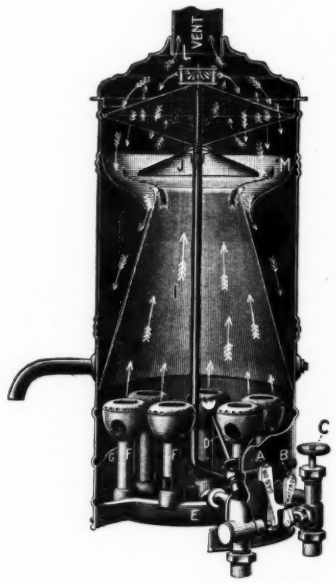
W. E. Garry, Philadelphia, is plumbing a residence of Mr. Farron, using Cooper's goods.—Advt.

THE CRESCENT INSTANTANEOUS WATER HEATER.

One of the most interesting little pamphlets sent us lately is one entitled "How the Millions Have Bathed." This is historic, interesting and very clever. Incidentally it descries the Crescent instantaneous water heater, of which there are two types, and we illustrate sectional views of both. The Crescent heaters

Nos. 1, 2 and 10) are constructed as shown in Fig. No. 1. "The water passes through the regulating valve F up the pipe to J, where it is poured upon the spirally corrugated copper tubes H and I, which distribute it over every part of the heated surface and deliver it sufficiently heated for the bath. If the water comes out too hot or too cold, it can be regulated by the valve F. It will be readily seen that by spreading a ½-inch stream of water over 11 square feet of heated surface (which No. 2 contains) the water must be quickly heated. The special and powerful burners make perfect combustion and prevent the explosive noise which other heaters make. There is no limit to the quantity of hot water, as by the construction the water heats while it is passing through the heater, so that a continuous stream of hot water is obtained as long as the gas and water are turned on."

The Crescent heater Nos. 6 and 8 is constructed as shown in Fig. No. 2. The operation is as follows: The small gas cock D is first turned on and pilot pipe lighted. The gas and water levers A and B are then turned on. The gas passes into the burner ring E, then to burner pipes F F, where it instantly ignites from the pilot. The heat rises from the burners as shown by the ascending arrows, passing over the copper heating surfaces and through the perforated disks into the vent pipe. The water passes through the center of the revolving distributor, where it is showered into the perforated disks in a thin film, where it falls through the perforations, as shown by the arrows, and passes over the conical copper tube I and out of the heater. By the water being subdivided into a thousand particles in passing through the perforations, it becomes heated in a most remarkable manner and utilizes practically every unit of the heat."



Upon application to the manufacturers, the Humphrey Mfg. & Plating Co., Kalamazoo, Mich., this very interesting pamphlet will be sent.

THE SCAIFE RANGE BOILER.

For a great many years Wm. B. Scaife & Sons, of Pittsburg, Pa., have been making goods. Their house has been established since 1802. Some of their galvanized range boilers have been in use for 20 years and are perfectly good yet.

They are made with brazed seams and are thoroughly tested, and the manufacturers state that in localities where heavy pressure exists their boilers will give perfect satisfaction, and that they cost no more than others. When you write them for a complete catalogue, kindly mention "Domestic Engineering."

Merrick & Son, New Brighton, Pa., have some work on hand in which they are using Cooper's goods.—Advt.

WHEN YOU SEE PARAGON.

When you see Paragon marked on brass goods you may count on it that they are right, says William Mann, the hustling representative of the Sanitary Company, of Cleveland, O. Mr. Mann arrived in New York several days ago and is giving out copies of Catalog E, the Paragon latest, to architects and the trade.

City Delivery & Shipping Dept.
Telephone Call, 2302 Main

Main Office
Telephone call 190 Main

Thomas G. Knight

Plumbers' Steam and Gas Fitters' Supplies

WAREHOUSES:
351-353 & 364 Jay Street
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OFFICE: 359 PEARL ST.,
BROOKLYN, N. Y.

John Simmons Co.

110 Centre Street
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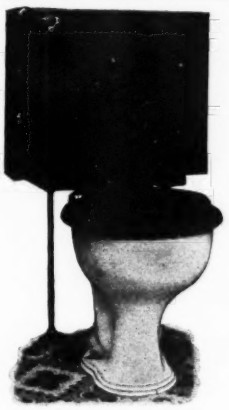
TRADE MARK

IRON PIPE, FITTINGS AND VALVES
FOR THE PLUMBER, STEAM- AND GAS-FITTER.

CAST-IRON SOIL PIPE
DRAINAGE FITTINGS
IMPROVED BATH-ROOM FIXTURES



THE MOST YOU KNOW ABOUT

The Thrush

Low Tank, Syphon Jet Closet Combination, is not as convincing as a complete

"Bill of Particulars"

We have other styles, too!

COLWELL LEAD CO.
63 Centre Street, NEW YORK.

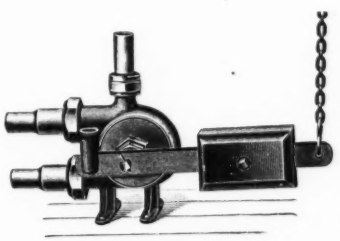
Telephone 640—38th Street
" 641 " "

John A. Murray

MANUFACTURER AND JOBBER OF

PLUMBERS', STEAM AND GAS FITTERS' SUPPLIES

625 AND 627 SIXTH AVENUE NEW YORK



Patented July 24, 1900.

Try It

and you will use no other.

ASBELL'S
FROST PROOF
HOPPER VALVE.

SEND FOR DESCRIPTIVE CIRCULAR AND PRICE.

THE S. J. ASBELL COMPANY
Van Houten St., near Cross St., PATERSON, N. J.

Mention Domestic Engineering.

Metropolitan Supply Company

Manufacturers and Dealers in

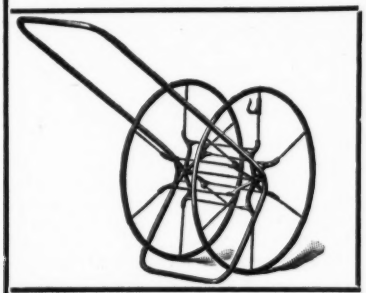
PLUMBERS' SPECIALTIES
PLUMBERS' and STEAM FITTERS' SUPPLIES.

SLATE AND MARBLE WORK
FOR PLUMBERS AND BUILDERS & TILING OF ALL KINDS

2505 Third Ave., New York City
Bet. 136th and 137th Streets

Telephone 701 Melrose.

WIRT'S ALL IRON HOSE REELS

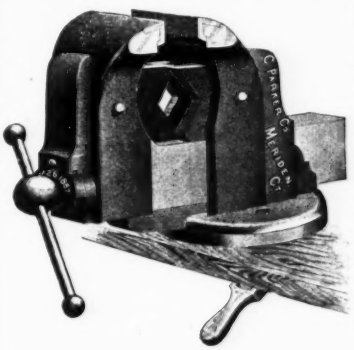


Are cheaper than Wooden Reels. They look better, last longer and give better satisfaction. They are the best for all purposes. Wirt's Wall Reels and Hump Racks for fire protection.

Wirt & Knox Mfg. Co.
219 N. Third St.
PHILADELPHIA, PA.

Our Discounts are Liberal

THE PARKER COMBINATION PIPE VISE....



Especially adapted to Plumbers and Steam Fitters use. Made in Six different sizes and every Vise all right. Ask for the "Parker" and you get a good tool. Sold by Jobbers.

...THE...

Charles Parker Co.
FACTORIES, MERIDEN, CONN.
New York Sales Rooms, 32 Warren St.

Chas. L. Holt, Lawrence, Mass., is plumbing some houses in that city, using Cooper's goods throughout.—Advt.

An Example of Progressiveness.

A good illustration of progressiveness is that shown by the way in which the J. B. Colt Co., of New York City, recovered after having sustained a complete loss by fire, which wiped out their entire office and factory on February 1.

These were located at 404-408 East 32d street. They immediately secured temporary offices at 108 Fulton street, and located their factory at 9 Desbrosses street. The latter they fully equipped with entirely new machinery, and in thirty days were filling orders for their product, and in sixty days the effects of the fire were overcome, so far as the interruption to the business was concerned.

The J. B. Colt Co. are well known in the manufacture of acetylene apparatus and accessories. The "Colt" generator is manufactured in sizes ranging from port-to machines for supplying whole cities.

They are now located in their permanent quarters on the street floor at 21 Barclay street, where they have a beautiful display of acetylene gas and the machines from which it is generated. They have a large show window in which are exhibited the various types of machines. Acetylene jets are burned in contrast with other forms of lighting. The offices are commodious and well equipped. In the basement is locatetd the generator which supplies the lights used. It has a capacity for supplying from one to two hundred lights, is automatic in its action, and is constructed on the principle of dropping a small charge of carbide into a large volume of water. This machine can be cleaned and recharged without inconveuience or dirt, and in a few minutes. The residuum is in liquid form, and is drawn off through sewer connection. Running water is attached to the machine.

A very unique way of exhibiting the light in contrast with other forms of illumination is in a dark room, equipped specially for this purpose.

Upon entering the dark room the first object seen is what is called a color box, a large iron, box-shaped contrivance which has four compartments running the length of the box. At the extreme back of this box there are different colored cloth goods connected together and operating as an endless chain over two rollers with crank attachment for revolving same.

The four compartments contain each a jet of acetylene a Welsbach burner, a 16 c. p. incandescent light and a 5 ft. open flame burner of ordinary city gas, which can be see through a glass.

These various lights are reflected on the cloth at the extreme rear of the box. With a piece of white goods at the back (which, in reality only showed white in the acetylene compartment), a skeptic would state that they were four different colors. The light given by the Welsbach burner has a greenish tinge; that given by the open flame burner of city gas, red, and that of the incandescent electric, red with a tinge of yellow.

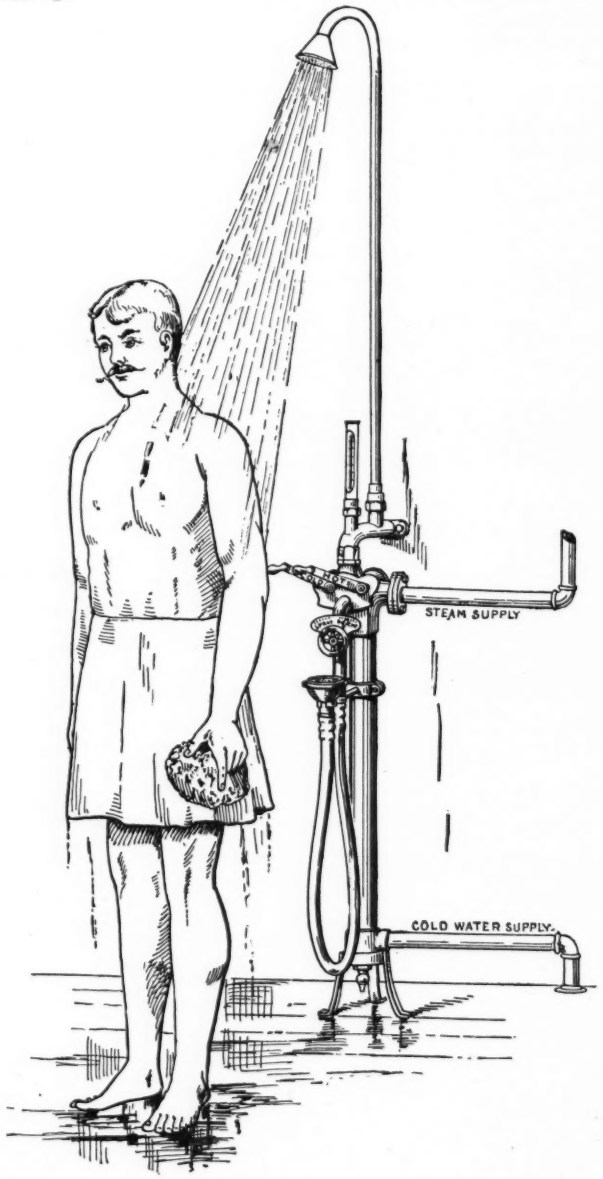
The effect upon other colors is more remarkable, particularly upon the delicate shades of pink, lavender and lemon. The reason of this, it is claimed, is that acetylene gas shows almost the same lines in the spectrum that are given by daylight. Acetylene gas is being used quite extensively for night photography, for making bromide enlargements and printing photographs.

Another apartment is furnished with carpets, furniture and oil paintings. These, together with the decorations of the room, were in the delicate colors which, it is claimed, do not appear in a true light under artificial illumination. The room is equipped with every method of lighting, including acetylene, and by turning from one to the other, the observer can see the effect of each contrasted with the other.

This exhibition is open to all those who desire to see it, and a cordial invitation is extended to the trade and public in general to visit the offices of J. B. Colt Co., at 21 Barclay street, New York City, where the beauties of acetylene can be seen to advantage.

A Bathing Machine.

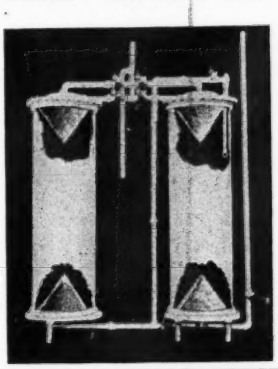
In public institutions it is necessary that some system of bathing shall be put in operation whereby the inmates can be bathed and still have the apparatus under the control of an assistant. The "Gegenstrom" hot water apparatus fulfills this requirement. We illustrate it herewith. It is designed for the instantaneous production of warm or hot water by means of steam, and is in absolute control of an attendant, so that any number of people can be bathed at one time and the temperature absolutely regulated by the person in charge and all danger of inmates tampering with the apparatus is avoided. It is particularly adapted for infirmary and penal institutions, insane asylums, hospitals, gymnasiums, armories and in public bathing establishments for the people. The western agents for this useful device are the Rundle-Spence Mfg. Co., of Milwaukee, who will be glad to send a descriptive catalogue of this device upon application if you mention "Domestic Engineering."



A Neat and Effective Book.

The Glauber Brass Manufacturing Co., of Cleveland, O., have issued their 1901 catalogue, modestly but effectively bound in black and sliver and containing a very full line of plumbers' brass goods, among which are also illustrated many new and improved articles which they have recently put on the market.

THE ECLIPSE DUPLEX FILTER



Easily and thoroughly cleaned with Filtered Water.

No Alum or Coagulent used for Clarifying

Send for catalogue and hundreds of references on the best filter made in the U. S.

ECLIPSE FILTER CO.
Philadelphia Bourse

WE CAN SAVE YOU MONEY

Cooper's Adjustable Drain Trap

Has a 4-inch Seal and is an absolute protection against Sewer Gas. $1.75 to $2.00 SAVED ON EACH TRAP. Write and we will show you how to make money.

Libbey, Parker & Co., - Boston

Sales Agents for Libbey Drip Valve, Victor Ball Cock and Victor Brass Pipe Hanger.

Send for Catalogue.

RELIABLE TINNERS' FURNACE

MADE BY

The SCHNEIDER-TRENKAMP Co., Cleveland, Ohio.

SOMETHING NEW

Vanderman's Adjustable Fitting for Connecting Soil Pipe

Send for Catalogue and Price List of Plumbing and Heating Specialties, or order through your Jobber.

Freight allowed on the Adjustable Fittings, East of the Mississippi river, on a dozen of one or assorted sizes.

MANUFACTURED AND FOR SALE BY

THE VANDERMAN PLUMBING AND HEATING COMPANY
Willimantic, Conn.

S. P. STAMBACH. ROBERT LOVE

Stambach & Love

Plumbing Supplies and Sanitary Specialties

50 AND 52 N. SEVENTH STREET
PHILADELPHIA

THE WILHELMI | THE MODERN

TWO BEST BOILERS

The "Wilhelmi" is a high-grade copper range boiler tested to 250 pounds and guaranteed to stand a working pressure of 150 pounds. There can be no better boiler made.

The "Modern" is for use where the pressure does not exceed 100 pounds, as that is the guaranteed working pressure. It is tested to 200 pounds.

BOTH BOILERS GUARANTEED NOT TO LEAK AND AGAINST COLLAPSE

Very attractive Discounts Furnished

For Sale only by Jobbers of Plumbers' Supplies

HAYES MFG. CO., Paterson, N. J.

The McGuire Adjustable

ROOF FLANGE

No. 1. will adjust from ¼ pitch to ½ pitch
No. 2. will adjust from flat to ⅓ pitch

Made for Standard and Extra Heavy Pipe in copper and Galvanized Iron. Only two sizes to be carried in stock as the adjustments fit all angles.

For Prices, etc., apply to

KENDRICK VALVE AND WASHER COMPANY,
SYRACUSE, N. Y.

The above cut shows our No. 1, ¼ to ½ pitch

MERRELL PORTABLE HAND PIPE THREADING AND CUTTING MACHINE.

Enclosed gears, no dust or chips admitted. Equipped with our Standard Adjustable Quick opening and closing Die Head and Cutting off Knife. Set by graduation to any size desired. Released from threading while in motion. Opened and closed instantly and positively. Self centering vise. Rapid, Accurate, Durable

THE MERRELL MFG. COMPANY, 208 CURTIS STREET
TOLEDO, O., U. S. A.
European Office, The Fairbanks Co., 16 Great Eastern St., London, E. C.

John C. Gunzer, Chestnut Hill, Phila., is remodelling the plumbing in the residence of Mr. Samuel Goodman, using Cooper's Nautilus closets, baths, etc.—Advt.

THE "AQUAMETER."

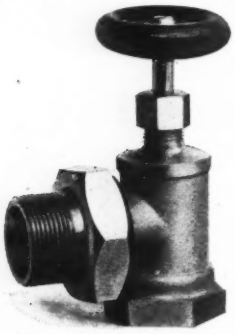
Here is an automatic, self-measuring flushing valve for use in closets and urinals, which measures the water for each flush. No ball-cock, tank or flush pipe is needed, as this may be attached directly to the pipe from the city main or a storage tank. It is made in two styles, for lever action and seat action, by the

Peck Bros. Co., 231 Washington street, Chicago, Ill., who guarantee it in every case. There are no cup washers used in its construction. It is giving complete satisfaction in a number of the largest buildings in the country. In writing, kindly mention "Domestic Engineering," and ask for a circular of their "Aquameter."

E. W. Clark, Cambridge, Mass., is remodelling the plumbing in a residence in that city, using Cooper's goods.—Advt.

CHEAP YET STRONG.

We illustrate herewith a new valve which is being put on the market by the Western Tube Co., of Kewanee, Ill. It will be known as the Waterloo. It is designed to meet the demand for a valve of low cost, yet unimpaired by weak construction. The bonnet and body is in one

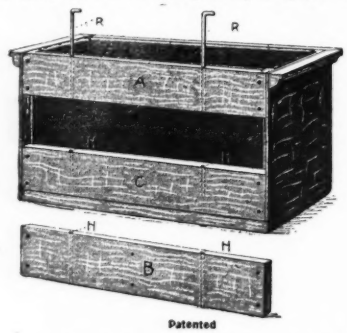


piece, as also the stem and disc, the idea being to place in the hands of the operator a valve of as simple construction as is possible. The valve has very few parts. Stem and disc, in particular, is so simple in construction that it is absolutely impossible to get out of order and is of such strength as will preclude its breaking by manipulation.

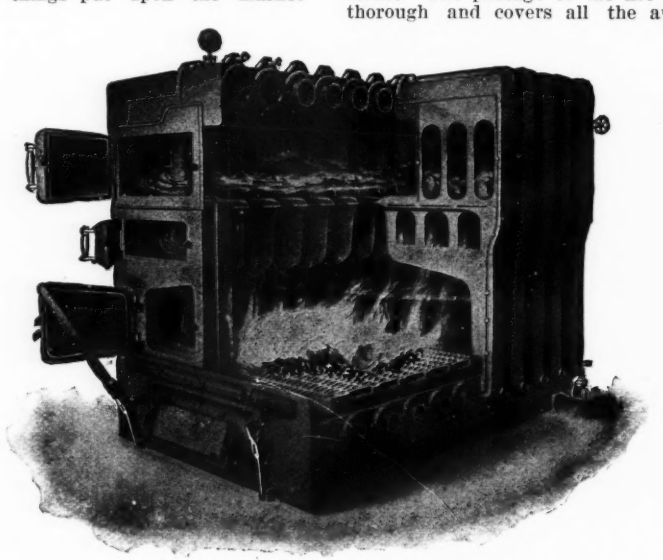
G. Wilbur Thompson, Newton Centre, Mass., recently set Coopers' Nautilus closet and other goods in an operation he has on hand.—Advt.

THE "EASY PUT UP" TANK.

Wm. Heap, of Muskegon, Mich., the veteran manufacturer of plumbers' woodwork, says that his "Easy Put Up" tank is taking with the plumbers very well indeed. We illustrate it herewith. The back piece B is fastened to the wall and then the tank is placed so that HH and C and B will come in line and then the iron rods RR are passed down through A B and into C, which completely engage the



back of the tank to the wall and avoids the use of brackets. It saves time and labor, is more secure when it is put up and is easily and quickly taken down. It is sold by jobbers, but if any jobber does not happen to have it, drop a postal card, mentioning "Domestic Engineering," to Wm. Heap directly, and he will tell you who does handle it. It is one of the cleverest things put upon the market lately.



Roberts Leinau, Philadelphia, is plumbing a residence at Rosemont, Pa., in which Cooper's closets are being used.—Advt.

A RUSH ON EAGLES.

Out of fire into a lively race to fill a large contract for Eagle Street Light Burners is an experience of the S. Bernstein Co., of 86 West Broadway, New York.

The Eagle Street Light Burner won the laurels for the company, securing the contract for lighting the City of Baltimore. The S. Bernstein Co. had made every preparation to begin on this work on March 4 but a fire in the building the day before prevented this, in fact it called for a decided change, as weeks would be required to place the building in repair and the contract calling for complete delivery May 15.

To meet the conditions the entire force of a well equipped machine shop in Connecticut was put to work making tools which were completed just as the building was far enough advanced to permit the installation of machinery. The contract calling for over a million machine operation was started as fast as the machines could be placed, and from April 10 to May 12 two shifts of men kept the wheels humming day and night, in fact during the above time the doors were never closed and the contract was completed by May 14, one day before the allotted time. The company has well earned the many congratulations it has received.

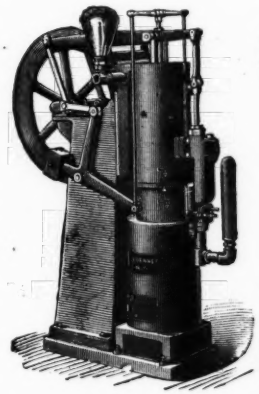
We are pleased to mention further that the sale of their Eagle instantaneous heaters has increased to such an extent as to require additional room and for which purpose another floor is being fitted up, giving the company the entire third, fourth and fifth floors of the building, 82-86 West Broadway. More machinery is being installed to keep pace with the rapid growth of the company's business.

THE '98 SERIES CAPITOL.

We show an illustration herewith of a sectional view of the '98 series of "Capitol" steam boiler which will repay examination. It will be seen that this heater is constructed according to the latest and most improved ideas in boiler building. Its sections are split and jointed in the center, making an easy boiler to construct. The passage of the fire is very thorough and covers all the available heating surface which gives it a large heating capacity. This is only one type of the "Capitol" boilers. Others will be shown in the catalogue which will be sent if you mention "Domestic Engineering."

USED BY THE GOVERNMENT.

The Penn Engineering Company, of 312 Cherry st., advise us that their "Ball Joint" pipe hangers are being used by the government in the new building for the Bureau of Printing and Engraving at Washington. They have recently made a large shipment of hangers and automtic air vlves to England and are in constant receipt of letters of inquiry from different European countries about their specialties. Their Mr. Helleman is now mapping out a trip to the west which will probably include all the large cities as far west as Kansas City.



Denney Improved

Rider and Ericsson

Hot Air Pumping Engines

Embody the very latest Improvements in Design and Construction.

The Most Reliable and Economical Engines for Pumping water.

Use any kind of fuel.
Can be operated by anyone.

Perfectly Safe, Noiseless,
Ever ready for Service

Built for years by

American Machine Co. WILMINGTON, DELAWARE

Agents Wanted in the West.

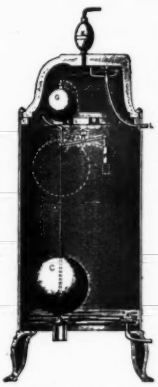
The Victor Supply Co.

Manufacturers and Jobbers of

Plumbers' Gas and Steam Fitters' Supplies

Write for Prices when in the Market.

Springfield, Ohio



PATENTED DEC. 4, 1894
PATENTED OCT. 15, 1895

Philadelphia Says It is the Best Beer Pump Made——

And our pamphlet tells why it is the only beer pump sold in town where it's made. We make attractive terms to our agents. Write us.

I.X.L. Pump Company

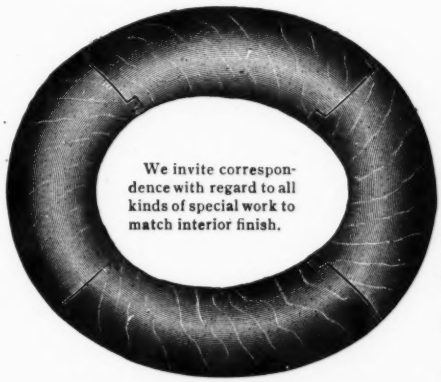
1015 Christian St., Philadelphia.

Self-Acting Hopper Valve

Very simply constructed. Has only one flat washer on inside. Repaired easily with pair of plyers. Does not hammer. Waste drains whole body of valve. Cannot waste when running. We give a very liberal discount to the trade and want agents.

The G. McG. Mfg. Co.

The G. McG. 1015 Christian St., Philadelphia, Penn.

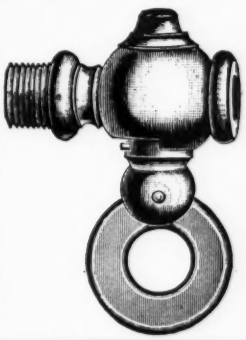


THE BEST PLUMBERS' WOODWORK MADE.

We make special orders in all fancy woods, such as Mahogany, Bird's Eye Maple, Sycamore, Black Walnut, etc.
We make drain boards in a superior manner, and invite sample orders.

H.B. Olmstead & Co.
87 Frankfort Street
NEW YORK CITY

Balls, Bodies, Binding Posts, Bushings, Caps, Cocks, Nozzles, Gas Stove Fittings, Nipples, Swings, Screws, Nuts, Wire Connectors Electrical Goods Etc., Etc. SPECIAL TURNING TO ORDER.



United Metal Mfg. Co.

525-527 Broome Street, New York

Manufacturers of

Gas, Electric and Combination Fittings

FROM BAR METAL

WATER SUPPLY WITHOUT WATER MAINS

The Kirtley Patent Domestic Water Service supplies country, village and suburban homes, business and public buildings with water supply where water mains are not accessible. Greatly increases a plumber's chance to do business. Write for descriptive circular.

GEO. P. KIRTLEY & CO., 1213 Walnut Street, Kansas City, Mo.

INTERNATIONAL SPRINKLER CO.

517 ARCH STREET, PHILADELPHIA, PA.

PRES., CLARKE MERCHANT
(Pres. of Merchant & Co., Inc.)

COMPLETE INSTALLATIONS MADE

"International" Head

THE BEST

The Company has a *complete equipment* for both the WET AND DRY SYSTEMS of Automatic Fire Extinguishers.

Its devices are fully protected by the U. S. Patent Office; and have the *full endorsement* of the *Insurance Companies*.

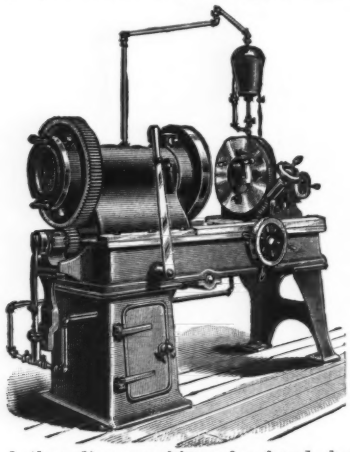
The "International" Head is in all respects the *best* on the market.

It is the *simplest, most reliable, most certain and most effective.* From *20 to 70 per cent. of cost of insurance saved* by putting "International" Sprinklers in your *foundry, factory or store.* Write for full particulars

J. G. Stacey, Geneva, N. Y., recently installed Cooper's Nautilus closet in a residence in that city.—Advt.

THE JARECKI PIPE CUTTING TOOLS.

We show herewith a pipe threading and cutting tool made by the Jarecki Mfg. Co., of Erie, Pa, whose complete catalogue shows a line of pipe cutting

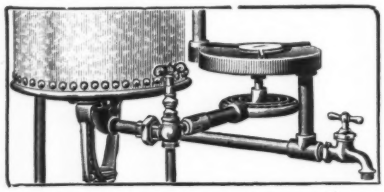


and threading machines for hand, belt, engine or with electric motor attachment for use on pipes from ⅛ to 16 inches. This catalogue will prove useful to anyone looking for tools. It will be sent upon application if you mention "Domestic Engineering."

Wm. Ingram, Chicago, has some work on hand in which he is using Cooper's Nautilus closet.—Advt.

THE HOLLANDS WATER HEATER.

This illustration shows a water heater for heating water in range boilers. The connection on the bottom of the heater and the top of the burner is for a nipple of any length desired. This heater saves the range boiler and heats the water

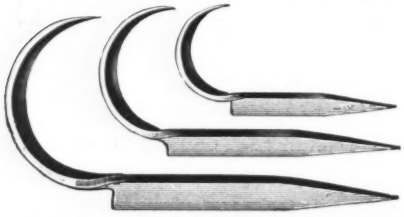


quickly. It also has the advantage of being used as a one-burner hot plate. With this connection any gas burner can be used, but this burner gives the best results and will cost the least. This is said to be the cheapest and most economical heater on the market for either natural or manufactured gas.

E. S. Haynes, Auburndale, Mass., has some nice work on hand in which he is using Cooper's Nautilus closet, bath, etc. —Advt.

MALLEABLE HOOKS.

These illustrate a few of the malleable and wrought pipe hooks made by Berger

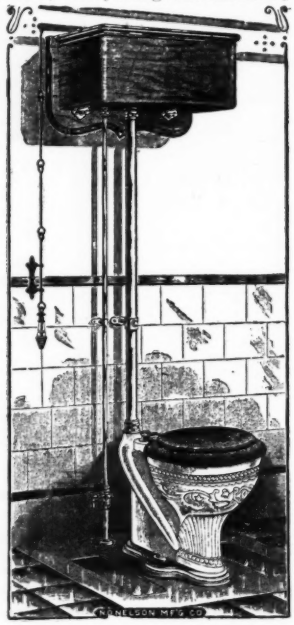


Bros. Co., 231 Arch street, Philadelphia, Pa. They carry a complete stock of every size and the quality of their hooks is the very best that can be made. A catalogue will be sent and prices quoted which will interest you if you are a careful buyer if you write them mentioning "Domestic Engineering."

G. W. Branch, Boston, Mass., is plumbing a residence in Belmont, Mass., using Cooper's Nautilus closets, lavatories, bath, etc.—Advt.

THE NEW "DOMINION."

We illustrate herewith plate 315 C from the catalogue of the N. O. Nelson Mfg. Co., St. Louis, Mo. The illustration shows a new high grade siphon jet closet with a double jet and polished woodwork, everything mechanically per-

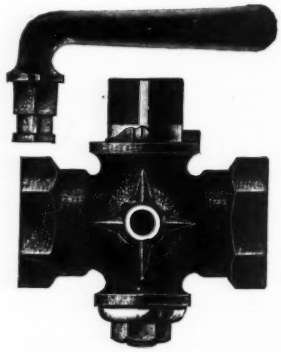


fect, and absolutely guaranteed. It is known as the new "Dominion," and prices may be had upon application to the manufacturers. If you do not have the Nelson catalogue you ought to get it and keep it where you could put your finger on it at any time. It will be sent if you write, mentioning "Domestic Engineering."

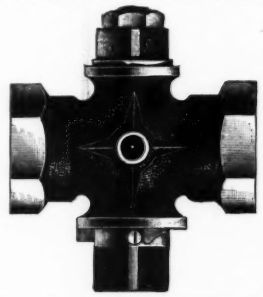
Costello & McGee, Denver, Colo., have some nice work on hand in which they are using Cooper's showers.—Advt.

A STOP AND WASTE COCK INVERTIBLE.

The two illustrations we show herewith describe the invertible stop and waste cock made by the J. B. Campbell Brass



Works, of Erie, Pa. The square shoulder at the bottom is identical in size with that at the top which permits the waste cock to be set in either direction. Plumbers will appreciate the advantage of this in certain places. It has other advan-

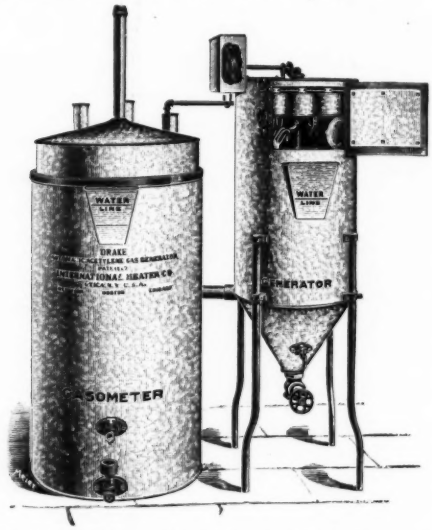


tages in style, finish and quality of material which appeal to good buyers. Upon application, mentioning "Domestic Engineering,' circulars will be sent.
Use 2 CUTS Page LIII.

W. P. Oglesby, Philadelphia, has the contract for the Merchant's Warehouse, in which they are using about seventy-five of Cooper's fixtures, including closets, lavatories, sinks, etc.—Advt.

THE DRAKE ACETYLENE GENERATOR.

We illustrate herewith the Drake automatic acetylene gas generator as made by the International Heater Co., of Utica, N. Y. It has been approved by the National Board of Fire Underwriters as a safe, durable and economical machine. It is not an experiment, and it does not belong to the light weight tin can class of generators. It is made upon



the principle sanctioned by acetylene authorities and is made to last. The gas, after it is generated under water, passes through a second body of water and a special purifier, and is delivered to the burner in the highest state of purity. Upon application to the makers, if you mention "Domestic Engineering" and ask for catalogue "H," a price list will be furnished with further information concerning this machine.

AN HARMONIOUS TRIO.

The Magee Furnace Co., of Boston, are sending to the heating trade a trio of booklets illustrative of their sectional and round steam and hot water heaters and of their tank and laundry heaters. The books are bound with a view to producing an harmonious color effect and give many valuable suggestions to the fitter and prospective buyer.

Eagle Stills Sell Well

They look well, work well, wear well—better than others that cost more and do less. Sanitary. Self-purifying. Automatic. Simple. Three parts – retort, distillate reservoir and condensing dome. Skeleton pattern handles. Nickel-plated faucets. 9 inches high, 15 in. diameter.

TWO STYLES.

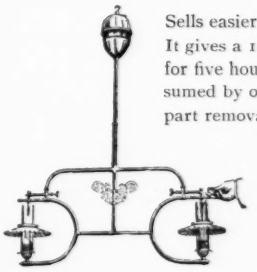
No. 9. Best Rolled Sheet Steel, heavily coated idside and outside with pure block tin, weight 3¼ pounds—$5 retail.

No. 11. Best Hard Rolled Solid Sheet Copper, pure block tin lining, weight 6 pounds—$8 retail.

Liberal Profit for Plumbers. Write

Health & Comfort Supply Mfg. Company
CINCINNATI, OHIO

The American Self-Lighting Lamp



Sells easier than any gasoline lamp on the market. It gives a 100 candle power light for less than 1 cent for five hours. It lights in one-fourth the time consumed by others, and with only one match. Every part removable and cleanable.

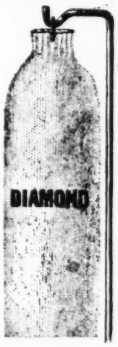
Approved by Underwriters

We want reliable Plumbers as Agents

The American Self-Lighting Lamp Company
PEORIA, ILL.

DIAMOND MANTLES

HAVE NO EQUAL



Investigate their merits and you will have an advantage over the dealer who uses any other make. Our chemist has had twenty-one years experience and in the "DIAMOND" has evolved the greatest efficiency possible in a mantle, a pure white incandescence of great candle power, equally good for gas or gasoline.

Diamond No. 1, . .	$12.50 per hundred
Diamond No. 2, . .	10.00 per hundred
Diamond High Pressure No. 1,	18.00 per hundred
Diamond High Pressure No. 2,	16.00 per hundred

Small orders, cash with order. Money refunded if goods not perfectly satisfactory. SPECIAL DISCOUNT TO JOBBERS

OMAHA MANTLE MFG. COMPANY
1319 DOUGLAS ST., OMAHA

THE ONLY SANITARY WASTE

THE PURITY BATH & BASIN WASTES

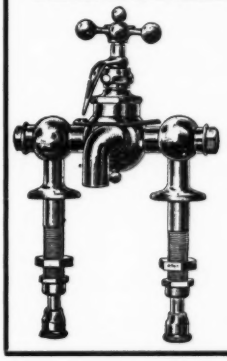
cut off the water in the Bowl or Bath from direct contact with the FILTH IN THE OUTLET PIPES.

Opens or closes with a touch,
Simple in construction,
No parts to get out of order.

FOR FULL PARTICULARS ADDRESS

THE H. M. WEAVER CO.
MANSFIELD, OHIO
New York Office: No. 81 Fulton St.

THE SODERLUND TWIN FAUCET



A COMBINATION HOT AND COLD WATER FAUCET WITH BUT ONE HANDLE. FOR BATHS, LAVATORIES AND SHOWERS.

Its features Cannot leak; practically self closing; always operates; simple; indicator shows temperature of water being drawn; gives full force of pressure; serviceable; sells on sight.

For prices write

UNION BRASS WORKS
11 Hawkins Street
BOSTON MASS.

C. A. MILLER

Master Plumbers

we have got you between us.

The Sanitary Supply Co.
Grand Rapids, Mich.

C. N. MARCELLUS — H. S. HUBBARD

BELL PHONE MAIN 336 - CITIZENS 2262

Billings Pipe Bender

Patented September 24, 1889
Invaluable to Plumbers—Saves Ten Times Its Cost Every Month. Send for Prices.

This device is a **Specially Shaped Spiral Spring** made from **Crucible Steel** wound tapering to one end so as to be easily withdrawn, and having a loop at the other to hook into when the bend is to be made in a long piece of pipe. The Bender placed inside of the pipe, supports and prevents the pipe from flattening or collapsing while being bent. By the use of it lead pipe, and copper, brass or steel seamless tubing may be quickly and easily bent. It is as easy to form opposite or double curves, such as goose necks, as a single bend.

We carry in stock ¾, 1, 1¼, 1½, 2, 2½ and 3 inch Benders.
Special sizes on demand.

The Billings Pipe Bender Mfg. Co.
38 Park Place and 33 Barclay Street NEW YORK CITY

CHAS. THACKARA, Pres. W. F. DUFFIELD, Treas. ELIAS HOGELAND Secy.
ESTABLISHED 1842.

THACKARA M'F'G. COMPANY,

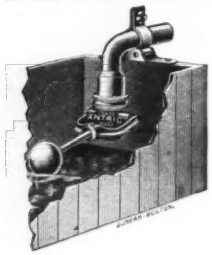
ELECTROLIERS,
GAS AND COMBINATION
FIXTURES,

1606 Chestnut Street, Philadelphia.

Dr. Pratt, Bryn Mawr, Pa., is having installed in his house Cooper's baths, lavatories, closets, etc. J. Edward Hoffer is doing the plumbing.—Advt.

THE XNTRIC VALVE.

No one would make the statement that there are not plenty of ball-cocks on the market, nor would anyone make the statement that there were too many good ones. The one we illustrate herewith is unique in that it has a ball which is but 3½



inches in diameter. Every plumber will know that this means that the ball closes with pressure, and all danger of accident is avoided. A postal card sent to the Xntric Valve Co., 36 Columbus avenue, Boston, Mass., will bring you a flier which tells all about it. Mention "Domestic Engineering," please.

R. G. Loughery, Philadelphia, is adding a bath room to Mr. Orum's house, using Cooper's baths, closet and lavatory. —Advt.

THE EAGLE HEATER.

This cut shows the Eagle No. 3 instantaneous water heater, which has an interlocking valve with safety pilot light which insures safety in using, as the gas

and water cannot be turned on until the pilot is lit. Upon application to the S. Bernstein Co., 82 W. Broadway, New York City, more complete information concerning this heater will be sent if you mention "Domestic Engineering."

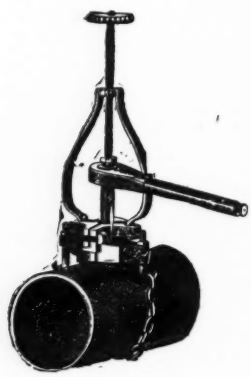
THE ACME NO. 15 HEATER.

This is a picture of the exterior of the Acme No. 15 instantaneous water heater which is made by the Instantaneous Water Heating Co., Ohio and Orleans streets, Chicago. The manufacturers claim that it has a larger heating surface considering its size than any other heater. It is 28 inches high, 12 inches in diameter and is listed in nickel at $20. The manufacturers also make other heaters, such as the "Douglas" and "Flush," and would be glad to send their new cat-

alogue to any in the trade not already in receipt of it. They have installed over 2,000 heaters in the city of New Orleans alone, which indicates to some extent the great popularity of their goods. In writing them, will you please mention "Domestic Engineering."

A PIPE TAPPING MACHINE.

J. M. Hadesty & Son, Tamaqua, Pa., make this machine for tapping water and gas mains against pressure. It is sold on approval, so that master plumbers who purchase it need not be afraid that it is not going to do what they expect. It will



tap from three to thirty-inch mains and requires no saddles for different sizes. It weighs, complete, only 18 pounds, and the manufacturers claim that a boy of 12 years can make a connection with it in fifteen minutes. Upon application to the manufacturers, prices and circulars will be sent if you mention "Domestic Engineering."

A NEW FIRE POT.

We illustrate herewith a new design of fire pot for round steam heater, which is made by the Reading Stove Works, Orr, Painter & Co., Reading, Pa. These heaters have been in use some years, but realizing the advantage of placing as much heating surface as possible close to the fire, the manufacturers have introduced a series of water arms directly over the fire.

These are shown in the cut with the inverted fire pot and give an increased heating surface where it will receive the

greatest amount of heat. The gases impinge against the sides of this surface, making it all direct and most effective. They are then carried vertically through the several flue holes directly against the underside of the dome and drawn down and around the baffle plates before going to the smoke pipe. This arrangement of the draft is very well shown on the open vertical cut except that with the new fire pot the draft is more directly vertical and more effective.

Accurate tests of actual amount of water evaporation per pound of coal per hour in the new heater have shown an

increased efficiency of 25 per cent over the plain fire pot.

Some sizes are now ready and the firm will be prepared to ship all sizes within a few weeks. Send for their complete catalogue of "Sunshine Heaters" and mention "Domestic Engineering."

THE LEONARD CLOSET REPAIR

Read what the Trade say;

"I am pleased to be able to highly recommend it after giving it a thorough trial. It certainly fills a long felt want, because it will fit any closet. It is simple, strong and durable and I have failed to find one leak after first putting it in place."

F L. PORTER, CHICAGO

Sold by Plumbing Supply Houses. Send Sixty Cents for Sample.

GEO. B. LEONARD

216 East Forty-first Street, Chicago.

WATER ENGINE FOR BLOWING PIPE ORGANS

Water Motors

for all kinds of power.

Also Gas Engines

Chicago Water Motor & Fan Co.

216 Lake Street CHICAGO, ILL.

THORIUM

and other

Mantle Chemicals

J. MARSCHING & CO.

27 Park Place **New York**

Write for Terms

The Niagara Falls Acetylene Generator

Like its patronym, **Powerful and Never Failing.** Costs less than any; attached to any house-piping; automatic in production. Really the best for agents.

Niagara Falls Acetylene Gas Machine Company.

NIAGARA FALLS, N. Y.

FAULTLESS Bib Seat Dresser

Heavy Brass, Nickel Plated, Removable Cutters in four sizes, ⅜, ½, ⅝, ¾ in. Height 4½ in. Revolving shank encased in long sleeve, thereby holding cutter rigid where bell shaped funnel is screwed down on top of valve, hence cutting a true, perfect seat in all sizes of Bibs.

This is the only practical tool of its kind on the market. Send for prices

American Distributing Co.

SYRACUSE, N. Y.

ABNER

"GIANT" & "JUNIOR"

Acetylene Generators

10 to 12,000 LIGHTS AND OVER

For Homes, Schools, Churches, Opera House, Factories, Lodge Halls, Stores, Village and Town Lighting. We have the only Complete Automatic Generator of the Unlimited Capacity. Town, County and State Agents protected. Write for prices and terms.

The Abner Acetylene Gas Company

26 La Salle Street, Chicago

The Policy of this Journal

WE believe success—long continued, permanent success—can only be achieved in the newspaper business by conducting it in the same way a man builds a good reputation—it must have character back of it, and character, a strong character, must be based on honest intention. We all slip up in fulfillments, but good intent is necessary if good fulfillment ever comes. Our intent is to print the best trade journal in the world, in the best way, seeking for the best result. If you think we are falling short of the mark, in the interest of good results, please let us know.

DOMESTIC ENGINEERING,
JNO. K. ALLEN, President.

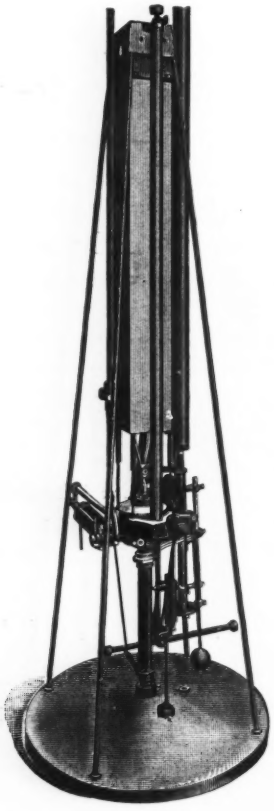
The Furman Boilers.

The Herendeen Manufacturing Co., of Geneva, N. Y., send us one of the latest editions of their catalogue for 1901-1902. It shows a full line of their celebrated Furman boilers for steam and hot water heating, giving dimensions and capacities and the salient points of superiority in each.

David R. Burns, Philadelphia, is plumbing the new residence of Mr. Wm. H. Sayen, at St. Davids, Pa., using a large number of Cooper's Nautilus closets, baths, lavatories, and other plumbing goods.—Advt.

The U. L. Generator.

We illustrate herewith a piece of apparatus which bids fair to popularize the use of gasoline for lighting purposes and incidentally to make much business for those plumbers who are enterprising enough to put themselves in line. The Universal Light Company, of 26-28 No. Canal street, Chicago, have perfected in their U. L. Generator, a system of light-



ing by gasoline which is already casting other systems of lighting into the shade, causing the oil lamp to look like a glow worm, a gas light like a tallow candle, and equalling the brilliance of the electric light at one-tenth of the cost.

With the U. L. Generator it is possible to burn one light or fifty, as the generator is automatic and self-regulating. It is simple and safe, the generator working equally well when the gasoline tank is placed in some remote corner a hundred feet away. Agents are finding it a money-maker, as the company gives a liberal discount. Plumbers are in better position than anyone else to push this new invention. For terms and territory, write the Universal Light Co., 26-28 No. Canal street, Chicago.

W. J. McGuire & Co., Toronto, is plumbing the residence of Mr. Jas. R. Wilson, of Montreal, using a number of Cooper's Nautilus and Reno closets and other goods.—Advt.

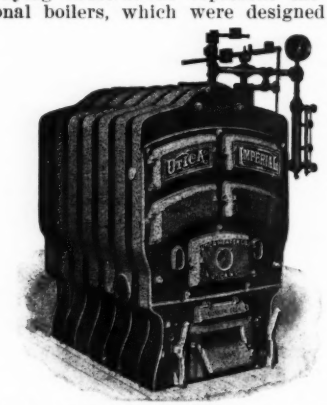
Spreading Out.

The Philip Carey Mfg. Co., of Lockland, O., advises us that they have recently opened office and warerooms at Atlanta, Ga., Denver, Colo., Mexico City, Salt Lake City, Utah, and El Paso, Tex. They also have representation in Canada and a number of foreign ports as well as in all of the principal cities of the United States. The demand for their products, especially for their asbestos and carbonate of Magnesia sectional steam pipe and boiler coverings, has increased so rapidly of late that they are constantly adding not only to thir manufacturing plants at Lockland and Plymouth Meeting, Pa., but to their offices and warehouse facilities in order to take care of such a growing business.

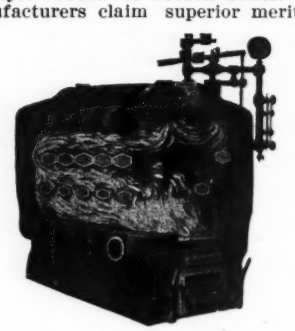
W. A. Julian Co., Tucson, Arizona, have a fine plumbing operation on hand, in which they are using Cooper's baths and solid porcelain lavatories, Nautilus closets, etc.—Advt.

New Line of Boilers.

The Utica Heater Company, of Utica, N. Y., have recently placed upon the market a new line of round and sectional steam and hot water boilers, to be known as the "Imperial." The accompanying illustrations represent the sectional boilers, which were designed for



use in large heating systems where the portable boiler, with circular firepot, has proven inadequate to carry the required amount of radiation. These sectional boilers are also being substituted for the old style tubular or firebox boiler. The manufacturers claim superior merit for



this new line of sectional boilers, which are convenient to install, are easily operated and most economical in the consumption of fuel. Many new and desirable features have been introduced in their construction that have never before been employed in the manufacture of any boiler of this type. There is a large amount of overhanging surface in the firepot, which surface has all of the advantages that are claimed for drop-tube, but being connected with the sides of the boiler, there are none of the disadvantages. The value of the overhanging surface is best demonstrated by the excellent results obtained, even when running a low fire.

The area and arrangement of the flues are such that they are readily kept clean and free from accumulations of soot as they are easily accessible for cleaning.

The method of connecting the sections with tapered cast iron push-nipples is entirely new and original; an extra large push-nipple is employed to provide an open steam dome at the top of the boiler. This is a manifest advantages over the

troublesome header, which is employed in the case of most boilers of this type, to connect the sections. This construction also saves materially in the height of the boiler, making it possible to install them in the lowest cellars. The grates are constructed to allow for liberal air space, but at the same time the grate bars are sufficiently close to permit the use of pea or slack coal. By a simple latch device, readily operated, provision is made so that the grate bars can be dumped when it is desired to clean the fire.

The fire pot is corrugated, so that perfect combustion is secured to the edges of the grates. The sections are connected by cast iron push-nipples, the same material as the sections themselves, and in consequence the efficiency of the points is in no way impaired by expansion or contraction.

The manufacturers claim superiority of this push-nipple connection over the packed joint, which has been thoroughly demonstrated in the large number of "Imperial" sectional boilers that have been successfully installed throughout the country.

The Utica Heater Company are also manufacturers of the popular and widely known line of "Auburn" steam and water boilers, for magazine or surface feed. Descriptive catalogues will be sent upon application, by addressing the Utica Heater Co., Utica, N. Y.

HARMONY OF HIGH QUALITY
AND REASONABLE PRICE.
SUCH IS OUR POLICY. TRY US.

FARNAN BRASS WORKS, CLEVELAND, OHIO

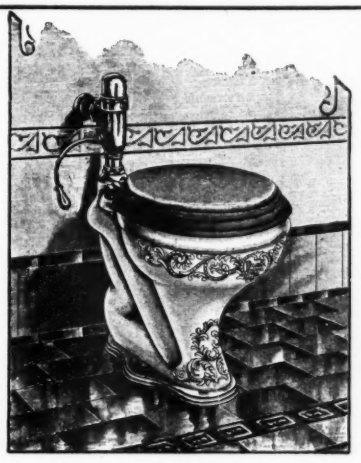


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Fig. E. 99. ANGLO. Lever action.

IT WILL PAY YOU TO DROP US A LINE FOR OUR CIRCULARS AND PRICES OF

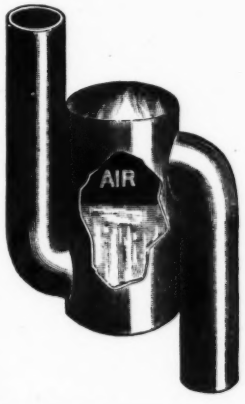
The Watrous

"AQUAMETER"

It is a self-measuring flush valve for water closets and urinals, automatically measuring the water for each flush. No more ball cocks, individual tanks or flush pipes needed, as it may be attached direct to pipe from city main or storage tank. Made in two styles, **lever action and seat action.** The WATROUS "AQUAMETER" is in use in many of the best buildings throughout the country, giving perfect satisfaction in all cases. We would be pleased to refer you to same on application. We use no cup washers in the construction of this valve. Manufactured and for sale by

Peck Brothers Company

231-237 Washington Street CHICAGO, ILL.



OUR HEARTY THANKS

We extend to the trade and our plumber friends in general for their very liberal patronage of the **Clean Sweep Trap** the past year. We hope a continuance of your good will and if possible shall give you a better article in the Trap line than ever. The **Clean Sweep Trap** has no mechanical features whatever. Clean, wholesome, sanitary, under all conditions. **Please have** an eye on the **Clean Sweep Fuller work,** fine appearance, excellent workmanship, hammerless. That's all. Traps are sold by all jobbers in the United States, England, Canada, Germany, Norway.

Detroit Sanitary Supply Company

27-29 Jefferson Avenue DETROIT, MICH.

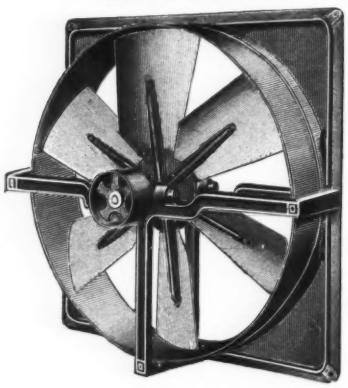
THE ONLY Metal Outlet Wash Down on the market with a Siphon Action...

The Dececo Colonial

Has large area of standing water, deep seal, strong siphonic action, no jets, full 3 inch waterway, noiseless action, self-testing submerged outlet joint. Uses only one half the amount of water required for jet closets. Furnished with N. P. Brass Outlet through floor or wall, high or low down tanks, or Dececo Flush Valve as shown . . . . . .

The Dececo Company
Boston, Mass.

TRIUMPH EXHAUST FAN



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TRIUMPH EXHAUST FANS, Belted in sizes of 14 inches to 96 inches; direct connected for all standard voltages of direct current, in sizes of 30 inches to 48 inches.

CEILING, COUNTER AND FLOOR COLUMN FANS for belt power.

WATER DESK FANS, COUNTER AND FLOOR COLUMN FANS, for water power and water motors.

Write for Catalogue and Discounts.

TRIUMPH WATER DESK FAN

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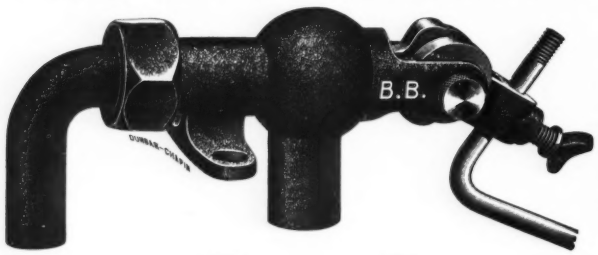
THE B. B. HIGH-PRESSURE BALL COCK



THE SIMPLEST AND BEST COCK EVER MADE.

No special packing required. Ground joint coupling which is always tight. Roller bearing lever on cam, reducing friction to lowest amount. No hammering, no singing or whistling. Has only one packing which is easily removed. Removable seat of best steam metal. We are making Floats stamped with our B. B. which are thoroughly guaranteed. Ask your jobbers for them.

Boston Brass Co., 36 & 40 Oliver St., Boston, Mass.

"PAWNEE"

LOW DOWN SYPHON HOPPER

WITH JET

ROUGHS IN AT 12 INCHES

QUIET AND EFFECTIVE IN OPERATION. WRITE FOR PRICES.

WE CARRY A COMPLETE STOCK OF **LOW DOWNS.**

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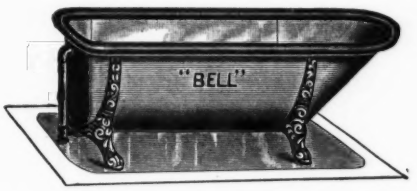

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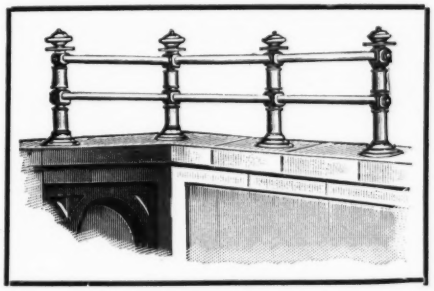
PLUMBERS' FINE WOOD WORK, LOW DOWN TANK COMBINATIONS, FLUSH AND SUPPLY PIPES



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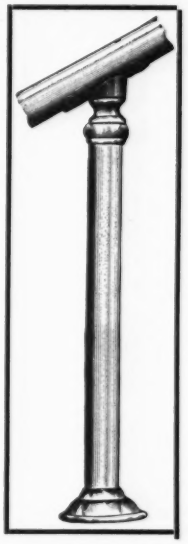
BAR RAILS STAIR RAILS STORE RAILS

ALL KIND OF RAILS

RAILS IN ANY FINISH
BRASS, BRONZE, OXIDIZED COPPER.
NICKEL, SILVER AND GOLD PLATED.



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The Columbus Brass Co., Long and Sixth Streets Columbus, Ohio.

ESTIMATES CHEERFULLY FURNISHED.

Lausten Lead Works

PRATT AND MORGAN STREETS
CHICAGO

Bi-metallic specialties
Lead traps and bends

Write for prices

Lead pipe, sheet lead
Ebony gloss plumbers' soil

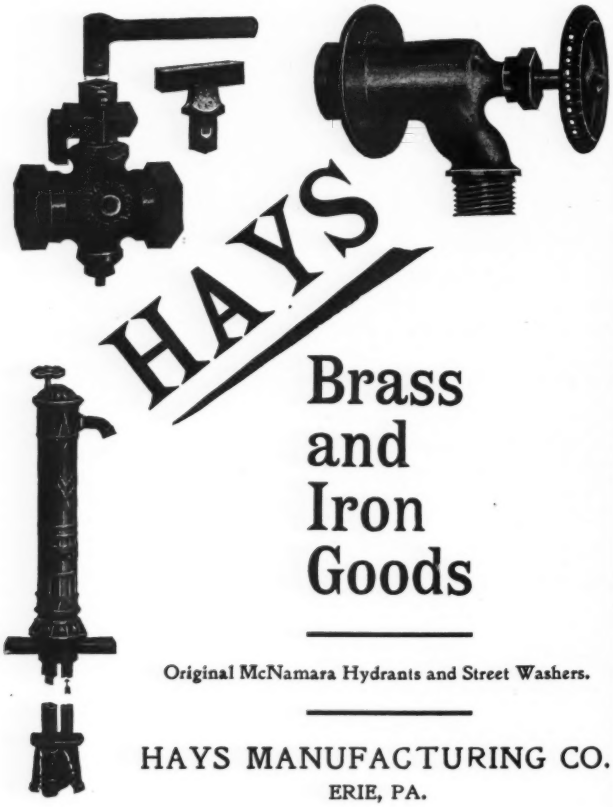
U. S. Government Says So!

The Barrett Sewer and Tide Trap has been in use by the United States Government for the past *Fifteen Years* which attests its *Value* as the *Best Trap* on the market. Government engineers pronounce it the most scientific trap made and the plumbing inspectors in every section of the United States consider it the ideal trap of this generation. Write for detailed description of the only trap that has conquered all opposition and is today the most scientific sewer and tide trap manufactured. Write for discounts.

James Barrett & Son

48 and 50 Pearl Street,
209-211 Franklin Street,

BOSTON



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Original McNamara Hydrants and Street Washers.

HAYS MANUFACTURING CO.
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The Champion

Water Filters

ARE

Germ Proof and Give Perfect Satisfaction

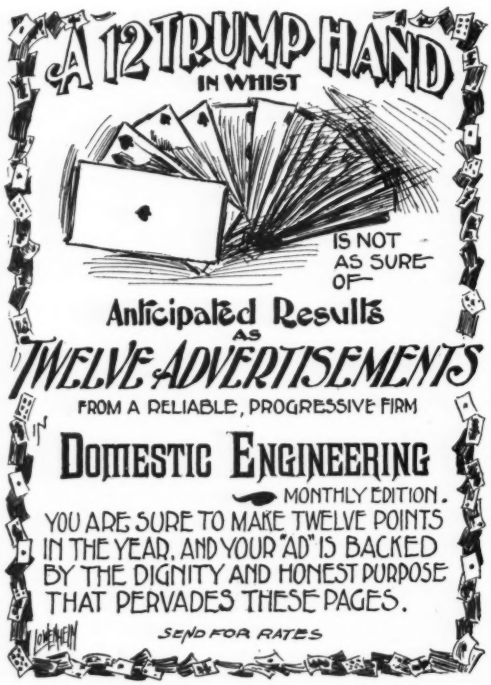
MADE IN

FIVE STYLES AND FOURTEEN SIZES.

Secure a profitable Agency.

Catalogue and Prices upon application.

THE
Champion Safety Lock Co.
95 Woodland Ave., Cleveland, Ohio, U.S.A.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IN WHIST
IS NOT AS SURE OF
Anticipated Results
AS
TWELVE ADVERTISEMENTS
FROM A RELIABLE, PROGRESSIVE FIRM
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YOU ARE SURE TO MAKE TWELVE POINTS IN THE YEAR, AND YOUR "AD" IS BACKED BY THE DIGNITY AND HONEST PURPOSE THAT PERVADES THESE PAGES.
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ACETYLENE GAS FIXTURES AND BURNERS

MANUFACTURERS OF
Gas, Electric and Combination Fixtures
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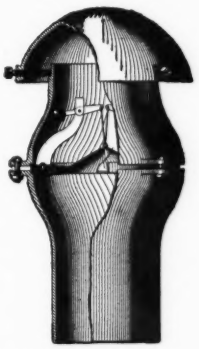

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The Hart=Ayers Plumbing Co.

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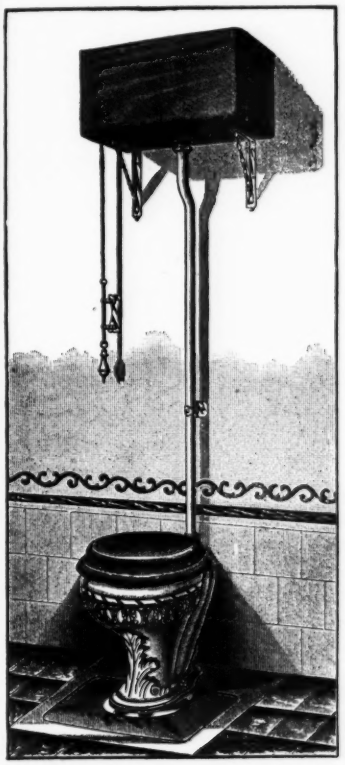
Fourth Avenue and Degraw Street,
BROOKLYN, N. Y.



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WITH ROLL RIM

A Beautiful, Clean and Durable Sanitary Fixture.

McClellan Anti-Siphon Trap Vent.

Lead Pipe, Lead Traps and all kinds of Plumbers' Materials.

F. N. DuBois & Company, 243-247 Ninth Ave.
NEW YORK CITY

MINUTES COUNT

When you have a "Rush" Job on hand 'tis then the virtues of

ARMSTRONG'S
WATER, STEAM AND GAS FITTERS
TOOLS

make themselves apparent.

They are made especially for Time and Labor—Saving and for Extensive Wear.

PIPE THREADING and CUTTING OFF MACHINES
HAND or POWER
capacity from 1-4 in. to 6 in.

PIPE WRENCHES
VISES
ADJUSTABLE STOCKS and DIES

Send for Catalogue

THE ARMSTRONG MFG CO
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NEW YORK 139 CENTRE ST.

The NO-LEAK REGULATOR

GUARANTEED NOT TO STICK OR LEAK

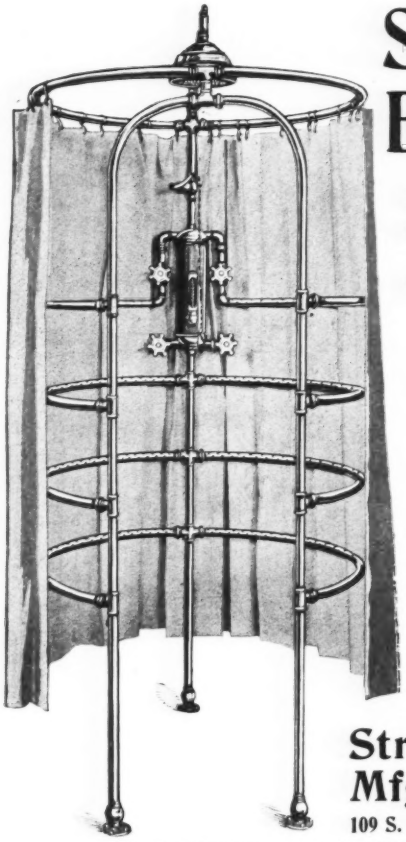
MOST PERFECT VALVE MECHANISM FOR CONTROLLING FLUID PRESSURE.

Patent Pending.

HughMerrie

225 East Ninth St.,

Cincinnati, Ohio



Shower Baths

Do we make them?

Well, we guess yes.

and any kind you may want, at prices that will interest you.

Catalogue for the asking.

Estimates cheerfully furnished on any special designs wanted.

Street & Kent Mfg. Co.

109 S. Jefferson St., CHICAGO

HENRY STEIN, Representative, 48 Cliff St., New York

Accessible Sewer Flushing Fittings.

Flushing Cleanout Trap.

Four Way Cleanout and Branch.

Straightway Backwater Gate.

Resist sewer or backwater pressure; location of sewers always known and accessible without disturbing floors or concrete; each fitting has iron inspection manhole to surface, with tight but removable cover; flushed by hose or may be connected to main water supply.

Made for either iron or clay pipes. Backwater gates may be attached preventing flooding of cellars. Can you imagine anything better?

CATALOGUE FREE

Iron Sanitary Mfg. Co.,

52-54 Dearborn Street
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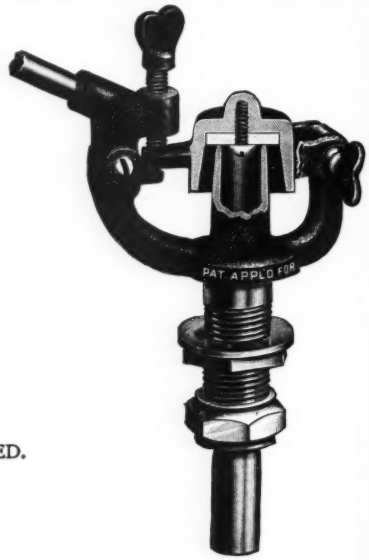
DALE
High Pressure Ball Cock

CANNOT POUND.
ALWAYS CLOSES.
ACCESSIBLE.
DURABLE.



PERFECT AND GUARANTEED.

MADE ONLY BY

WOLVERINE BRASS WORKS

GRAND RAPIDS, MICH.

WE ARE NOW MAKING

Enameled
Iron Baths

Also Sinks and Lavatories

Send for Catalogue E.

Henry McShane Mfg. Co.

BALTIMORE, MD.

You May Need Your Money!!!

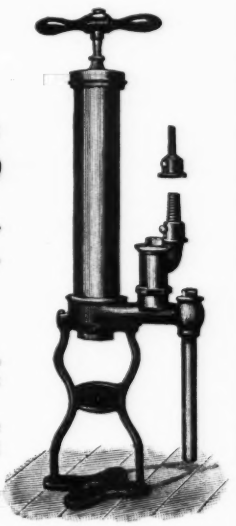
Don't buy 3 Pumps when one will do the work.

THE

PERKES

Patent Combination Air, Force and Test Pump.

Patented March 15, 1898.



Will test soil pipe, prove gas pipe, and there is no force pump made that is its equal.

No stuffing boxes; all valves are on the outside and work equally well with air or water.

Our circular will tell you of the other good points.

CHARLES PERKES

MANUFACTURER

Established 1856 627-629 Arch St., PHILADELPHIA

A SAMPLE FREE

Send to-day for a trial package of

WISCONSIN GRAPHITE PIPE-JOINT PASTE

It is an ideal preparation. Protects the threads on joints and conneetions, prevents leaking. Is certain, cheap, enduring.

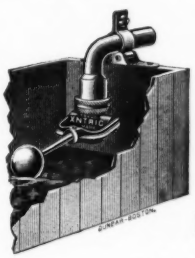
A SAMPLE CAN FREE IF YOU WRITE FOR IT.

Wisconsin Graphite Co.

403 Market St., Pittsburg, Pa.

YOU WANT THIS!

As you have been looking for it these many years.



The Xntric Ball Cock

For High or Low Pressure

Notice size of Ball. It is only 3½ inches

Practically noiseless. Guaranteed for two years. There is positively no hammering, and the only one on the market where the valve is closed by water pressure, and which obviates all danger of accident. Been on the market and heartily approved for three years. For use with hot or cold water

SEND POSTAL FOR FLYER TO

Xntric Valve Co.

36 Columbus Ave. Boston. Mass.

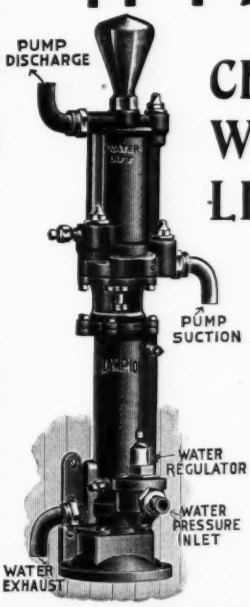
In use in Massachussetts State House and United States Postoffice, Boston.

THE CHAMPION WATER LIFT

IT PAYS

TO PUT IN THE

CHAMPION WATER LIFT



For pumping cistern water or for increasing city pressure it is the BEST.

IT WORKS PERFECTLY

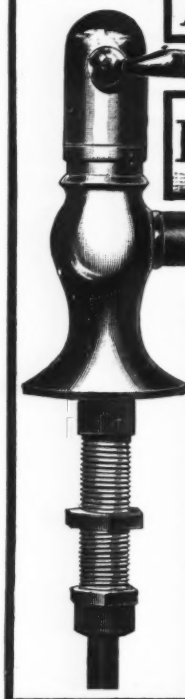
That is our guarantee, and our name is guarantee that the construction is right. Handled by all large jobbers. Write for catalog.

MADE ONLY BY

THE CLEVELAND FAUCET COMPANY

CLEVELAND: 15-27 Frankfort Street.
NEW YORK: 4 Great Jones Street.
CHICAGO: 92 Franklin Street.
SAN FRANCISCO: 202 Ellis Street.

THE CHAMPION WATER LIFT



All first class Plumbers are using the New Style

Broughton Self Closing Basin Cock

NO EXPOSED SURFACES, EASILY KEPT CLEAN

THE BROUGHTON SELF-CLOSING BIBBS & COCKS HAVE BEEN ON THE MARKET SEVERAL YEARS - SUPERIOR TO ALL OTHERS FOR SIMPLICITY AND STRENGTH - EVERY ONE WARRANTED.

Send for Circular and Price List

E. STEBBINS MFG. CO.
SPRINGFIELD MASS.

A GOOD ARGUMENT
IN FAVOR OF THE
Lyons Cocks

More of them sold last year than ever before. We are gratified to know that the trade appreciated our efforts to give them a first class article at a reasonable price. There are none can equal the Lyons Cocks.

MANUFACTURED BY
CLEVELAND BRONZE & BRASS WORKS
CLEVELAND, OHIO

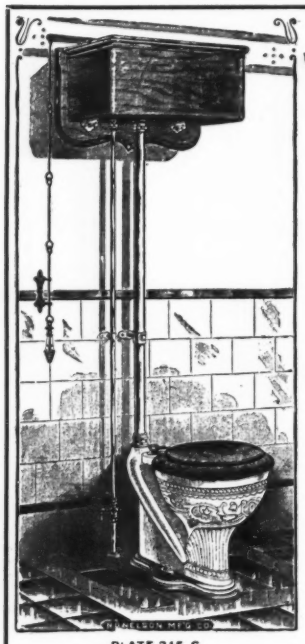


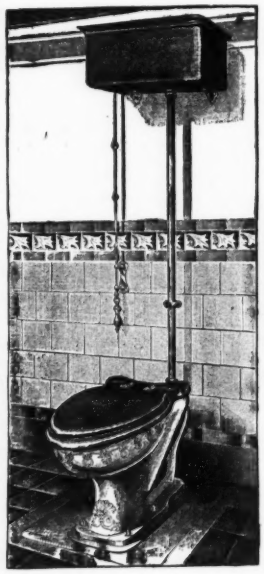
PLATE 315 C

Nelson's
High Grade Syphon Jets.

The New "Dominion"

Double Jet
Polished Wood Work
Mechanically Perfect
Absolutely Guaranteed

N. O. Nelson Mfg. Co.
...PLUMBERS' SUPPLIES...
ST. LOUIS, MO.



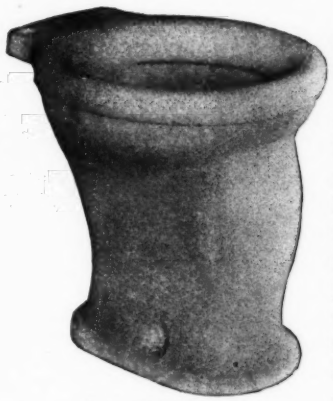
—THE—
ORINOCO
Syphon Jet Closet.

This Orinoco Syphon Jet Closet is what you should have. This is the most perfect and noiseless closet now manufactured. The workmanship and High Grade Finish of the Orinoco Closet cannot be excelled.

IT SPEAKS FOR ITSELF
TRY ONE AND BE CONVINCED.

MANUFACTURED BY
THE KING MFG. CO.
LIMITED.
205 Wood Street, Pittsburgh, Pa.

To the Plumbing Supply Trade:



No. 1. Plain Washdown

This cut represents our new improved plain wash down, which is made with walls one inch thick insuring unusual strength, thereby reducing liability of breakage to a minimum; it is therefore particularly adapted for public buildings, schools or any public place where closets are subjected to hard usage, and is designed to take the place of imported or domestic fire clay closets, and being constructed of a hard vitreous china body it is guaranteed against crazing. We can also furnish these closets with syphonic action or syphon jet.

We manufacture everything in the sanitary earthenware line and pay particular attention to specialties. All closets being tested before leaving our works, we guarantee their working qualities.

Bellmark Pottery Co.

P. O. Box 547. TRENTON, N. J.

THE REEX.

THE

KING

of them all.

Syphon Hopper
and
Trap Combined.

Surpassed by no Closet on the Market.

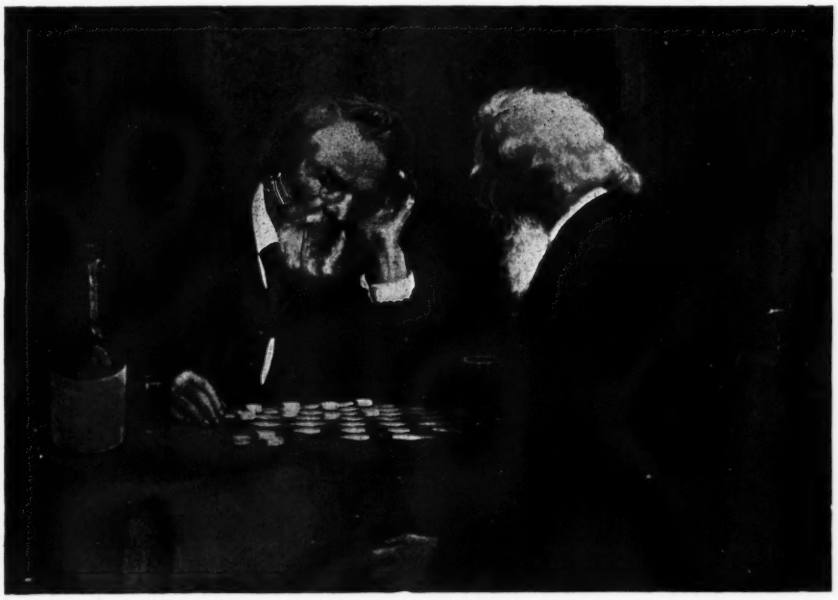
This closet has **full water ways** through all the **syphon pipes, a large water surface** and 3 inch Seal. It is made for high or low tank. Embossed or plain surface.

Earthenware Specialties designed and finished with unsurpassed art and workmanship.

The Sanitary Earthenware Specialty Company

Trenton, N. J.

THE AMERICAN PROGESS ENGRAVING COMPANY



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OF
FINE
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ILLUSTRATIONS

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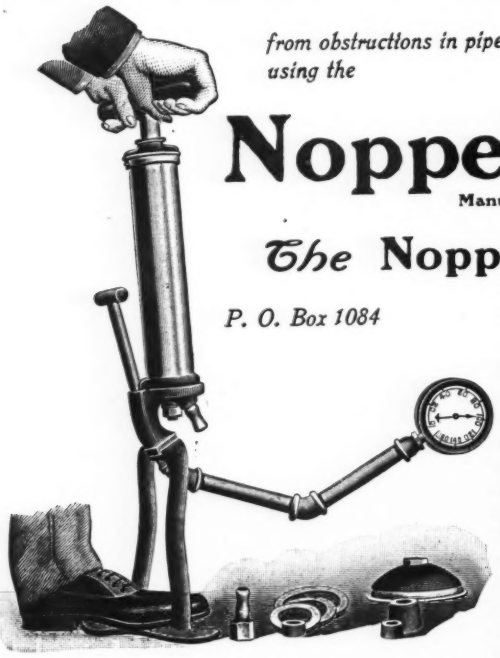
No More Trouble



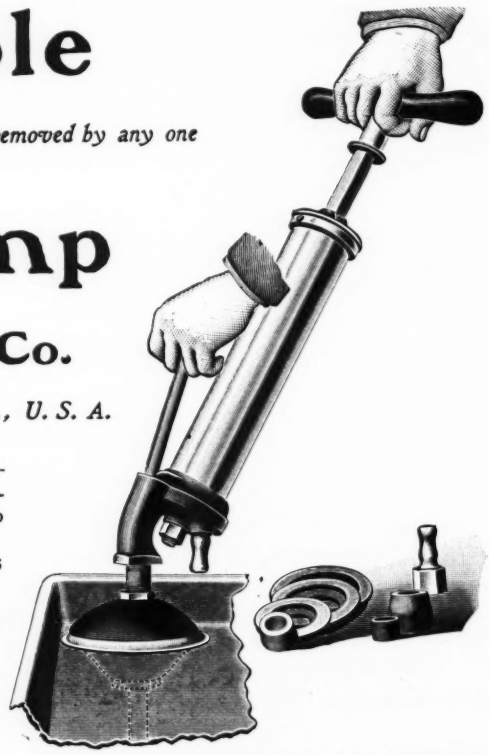
from obstructions in pipes. They can be easily removed by any one using the

Noppel Pump

Manufactured by

The Noppel Pump Co.

P. O. Box 1084 *HARTFORD, CONN., U. S. A.*



This pump is a Combination Lift, Force, Discharge and Test Pump and you can not only force air, liquid or gas into pipes, but can continue to do so, getting an ever increasing pressure. With no alteration in fittings or position of pump you can instantly change from force to suction and continue to exhaust air or draw out and discharge water and loose material. **No Other Pump has these Advantages.**

SEND FOR CIRCULAR

INDESTRUCTIBLE **SIMPLE IN CONSTRUCTION** **EASILY OPERATED**

Closets

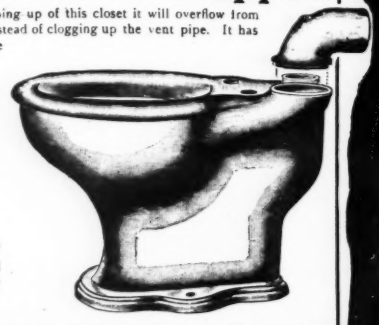
A complete line of closets for both high and low tanks

Lowdown fixtures of the syphon jet and hopper types—also the syphon hopper with jet pipe.

If there's any advantage in using any make of goods in this line, there's every advantage in using the products of a concern of

When Accidents Happen

In case of accidental stopping up of this closet it will overflow from the front on to the floor, instead of clogging up the vent pipe. It has other advantages that are not hard to see.



Plain Syphon Jet No. 62B

With Patented Vertical Local Vent and Crockery Vent Arm.

TRENTON POTTERIES COMPANY

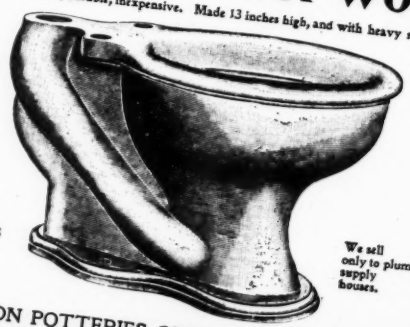
Sells to Jobbers Exclusively. TRENTON, N. J.

for fire-proof construction

Where the pipes are run above the floor—this Fire-Proof Wash Down — to be used with metal leg—made for either ⅛ or ¼-inch bend—operate with 1¼-inch connection, high tank—a perfect-working fixture—ask your jobber for circular and prices.

Here's just the thing **for school work**

Certain in action, durable, inexpensive. Made 13 inches high, and with heavy roll rims.



Plain Syphon Jet No. 61-B

We sell only to plumbing supply houses.

TRENTON POTTERIES COMPANY, TRENTON, N. J.

Do You Sell Instantaneous Water Heaters? Then

GET IN LINE

TO PUSH THE

Humphrey Crescent Instantaneous Water Heaters

We guarantee everything exactly as represented. Our prices are the **LOWEST.** If you cannot sell them, write and we will tell you how to do it and send you our new catalogue.

The Humphrey Mfg. & Plating Co.

KALAMAZOO, MICH., U. S. A.

This is our No. 8 Cresent Heater.

BEATS EVERYTHING ON THE MARKET AT ANYWHERE NEAR THE PRICE.

THE BEST ON EARTH.

Our New "Excelsior" Waste and Basin

PATENT APPLIED FOR

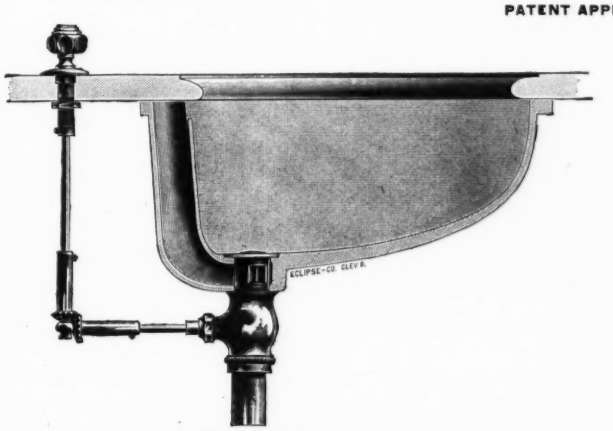


Fig. E 501.

We make the above Waste to fit the P. O. Bowls also.

THE MOST SANITARY COMBINATION ON THE MARKET.

This Waste cannot get out of order as will be readily seen. **We guarantee them in every respect.**

The Basin is the only one that can be cleaned **without removing a brass strainer.**

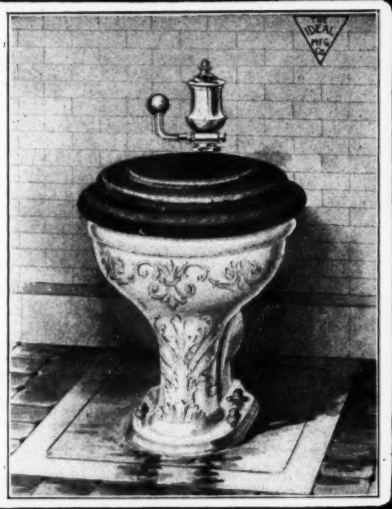
This Basin has no strainer, still only the dirty water can pass into the overflow, which is made in such a manner as to make it easily accessible. Our new Catalog E tells you all. Have you one?

THE SANITARY COMPANY

CLEVELAND, OHIO

THAT

IS THE ONLY PRESSURE REGULATING FLUSH VALVE ON THE MARKET. FLUSHING THE CLOSET WITH THE SAME AMOUNT OF WATER AT EACH OPERATION REGARDLESS OF FLUCTUATIONS IN PRESSURE AT THE MAIN OR SUPPLY WITHOUT ANY ADJUSTMENTS.



Perfectly Automatic Patented

The IDEAL Volumeter

THE IDEAL MFG. CO. DETROIT MICH.

The IDEAL Mfg. Co.

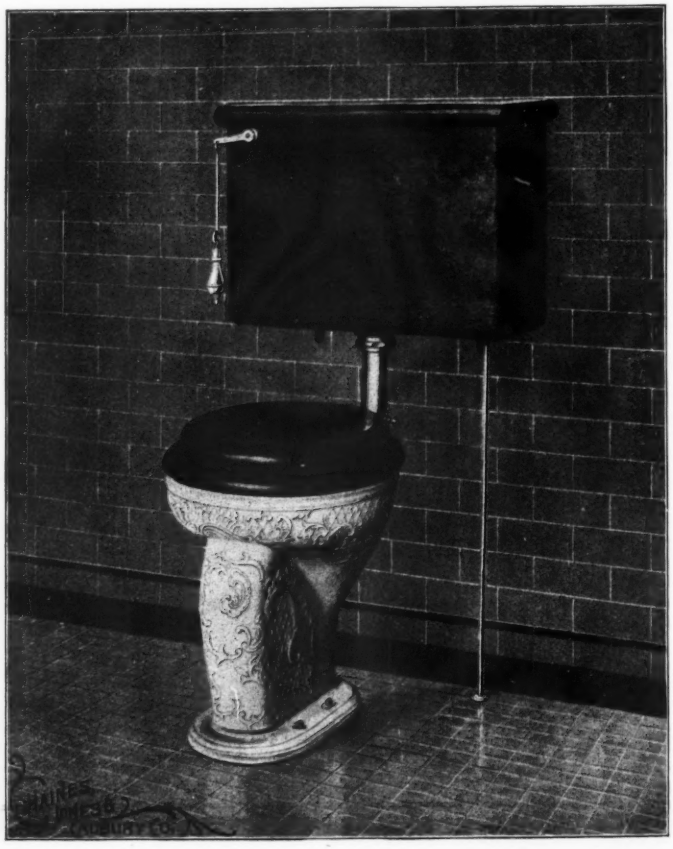
Manufacturers of

Fine Sanitary Specialties

DETROIT MICH.

GREENLEAF

THE IDEAL MFG. CO. DETROIT MICH.



The

"Sedate"

We Handle all grades of Low Down Tank outfits, including syphon jet, syphoning hoppers with jets and plain hopper and trap combinations.

We Manufacture the "QUIET" syphon jet and the "SEDATE" syphoning hopper outfits and recommend them to all who desire a thoroughly high grade and highly perfected outfit.

The TANKS, seats and lids are made from carefully selected hard woods, which are highly finished. The "Quiet" and "Sedate" tanks have heavy tinned copper linings and all seams are locked and carefully soldered.

Haines, Jones & Cadbury Company

1128-44 Ridge Avenue
1423 Chestnut Street

Philadelphia, Pa.

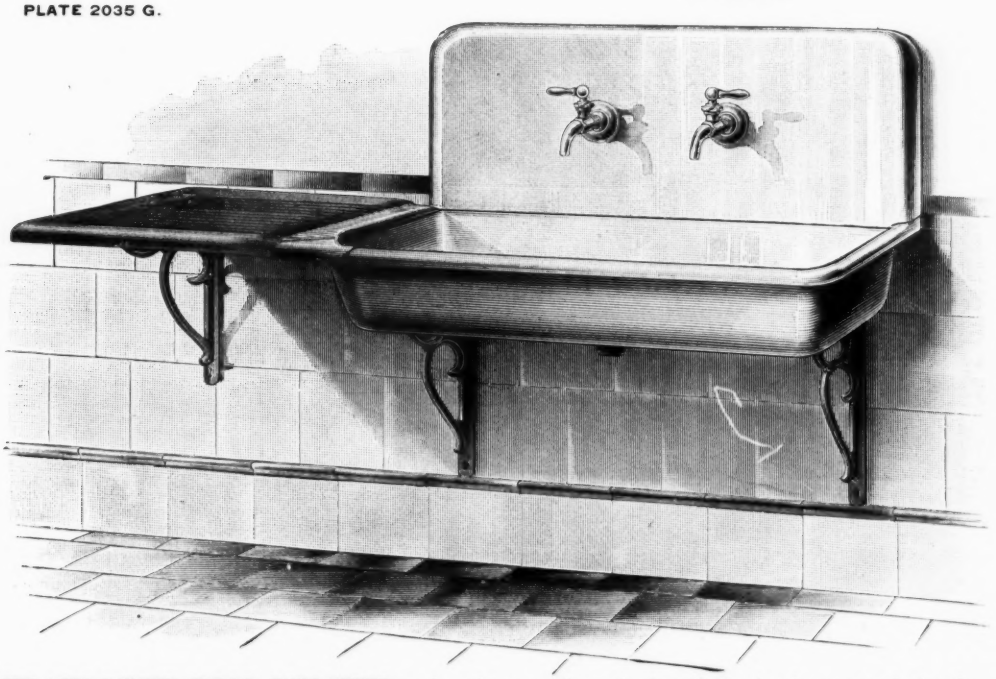
"Standard"

ROLL RIM KITCHEN SINKS

WITH INTERCHANGEABLE DRIPBOARD

(PATENTED)

PLATE 2035 G.



PORCELAIN LINED ROLL RIM SINK on brackets, with 15 inch roll rim back, concealed galvanized air chambers, 18 inch **Interchangeable Wood Dripboard with Enameled Iron End** and Bronzed Iron Bracket and Nickel-plated Brass Faucets. Brackets and Exterior of Sink Bronzed.

Interchangeable Wood Drip=board with Enameled Iron End

(PATENTED)

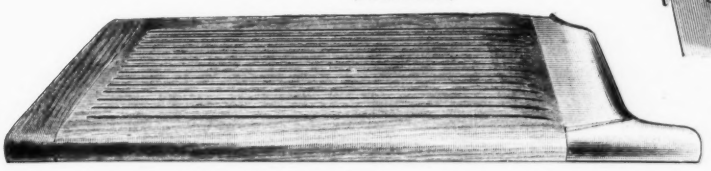
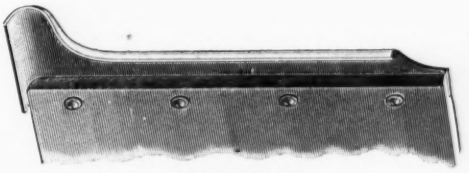


PLATE 2037 G.



END VIEW.

For use on Full Roll Rim Sinks.

STANDARD SANITARY MFG. COMPANY

GENERAL OFFICES, STANDARD BUILDING, PITTSBURG, PA.

BRANCH OFFICES

NEW YORK, 81 Fulton St.
CHICAGO, 415 Ashland Block.
ST. LOUIS, 622 Security Bld'g.
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You must disarm your competitors. Domestic Engineering's

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Price, $3.00 Delivered

Domestic Engineering

58-64 North Jefferson Street, Chicago, Ill.

THE "GEGENSTROM"

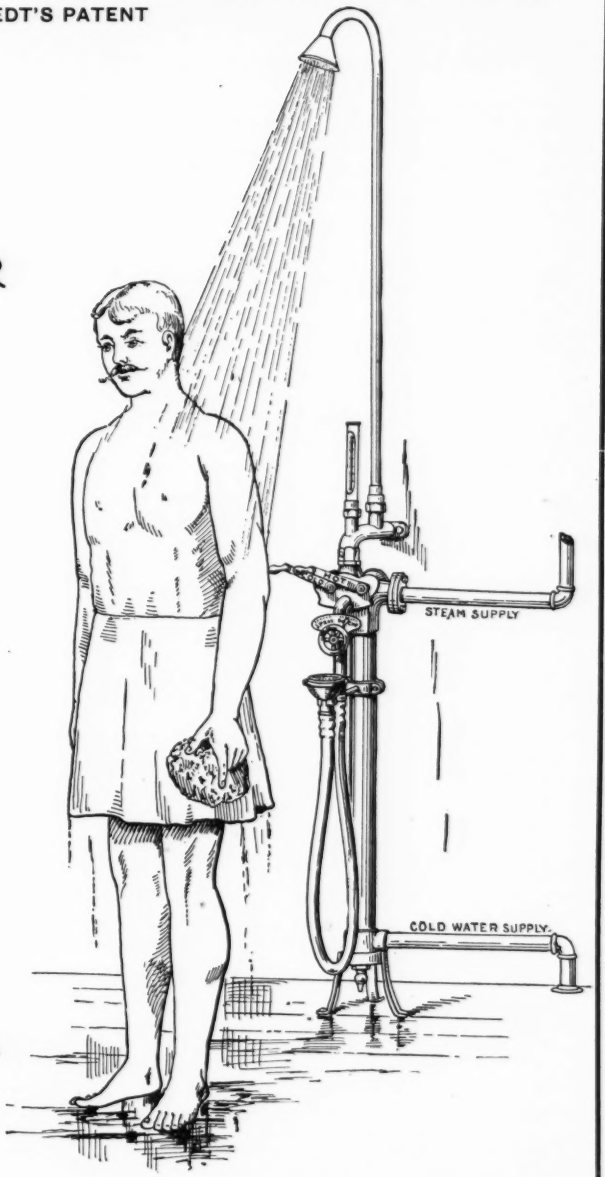
HOT WATER APPARATUS

SCHAFFSTAEDT'S PATENT

FOR THE INSTANTANEOUS
PRODUCTION OF

WARM OR HOT WATER

BY MEANS OF STEAM.



ESPECIALLY ADAPTED FOR

RAIN BATHS

IN INSTITUTIONS,
REFORMATORIES
AND PRISONS,
IN HOSPITALS,
INSANE ASYLUMS,
GYMNASIUMS,
ARMORIES
AND IN
PEOPLE'S BATH ESTABLISHMENTS.

RUNDLE-SPENCE MANUFACTURING COMPANY

THE PEOPLE WHO DESIGN AND MAKE MODERN AND RELIABLE
PLUMBING FIXTURES. (THE GUARANTEED KIND.)

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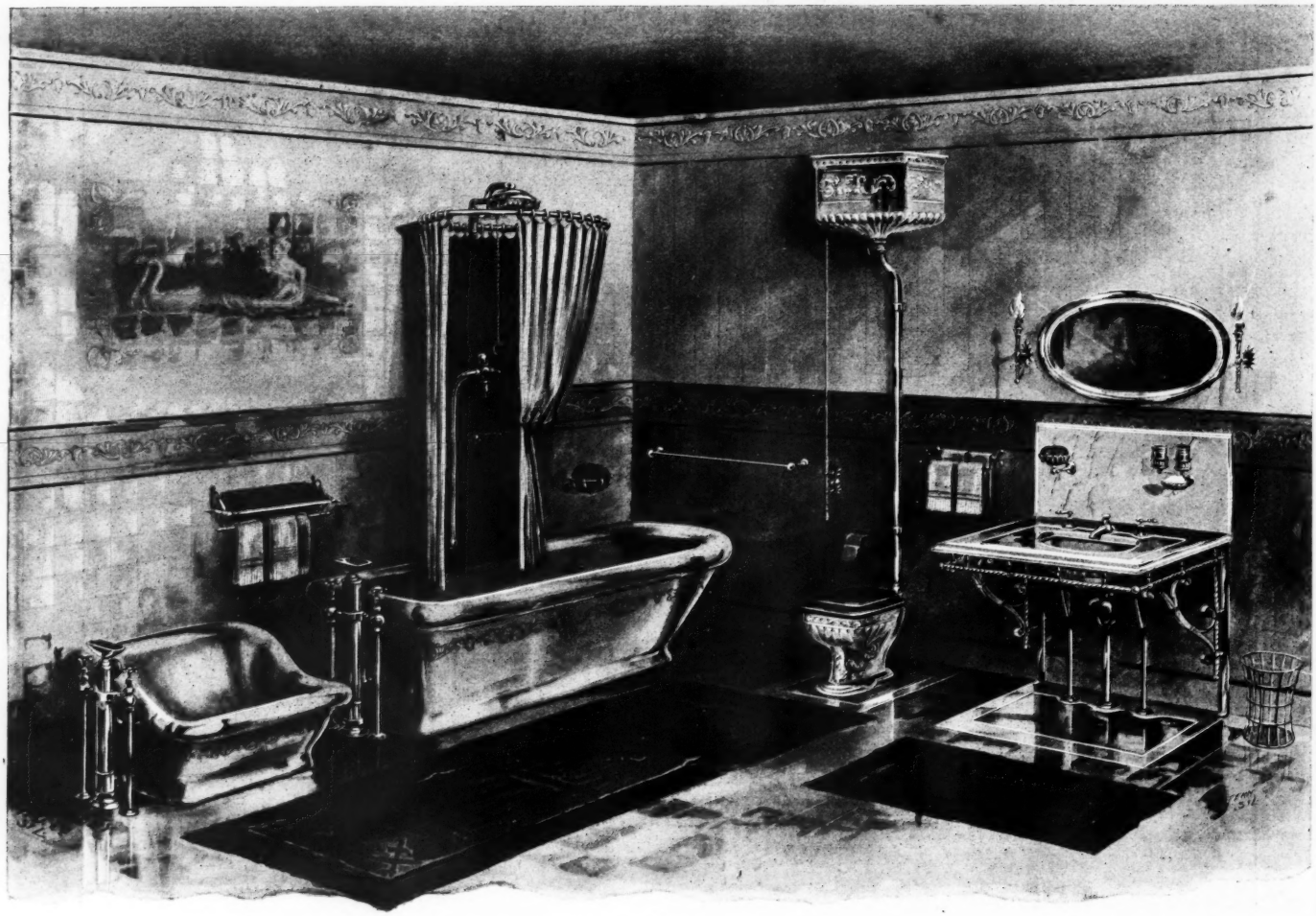
63-67 SECOND STREET
MILWAUKEE

WESTERN AGENTS

52 DEARBORN STREET
CHICAGO

RUMSEY'S "UNA-SEAL"

BATH ROOM COMBINATION, COMPRISING



BATH.—"Una-Seal" Solid Porcelain Roll Rim Bath Tub, 5½ feet long, Class "A," with Porcelain Base to the floor, glazed inside and over Rim, exterior finished Zinc White with "Una-Seal" Decoration, Nickel-plated Low Bell Supply Fitting with Supply Pipes and "Superior" Waste, Nickel-Plated Combination Needle and Shower Bath with Rubber Lined White Curtain.

WATER CLOSET.—Square Embossed "Una-Seal" Syphon Jet Closet (Vitreous Ware) with Mahogany Seat and Cover, No. 25 Embossed Porcelain Syphon Tank, Nickel-Plated Flush and Supply Pipes, Nickel-Plated Rod and Pull Guide and Porcelain Pull. Decoration on Closet and Tank.

LAVATORY.—Italian Marble Lavatory, 34x24 inches with 16-inch Back, 14x19 D-shape Basin, Nickel-Plated "Olympian" Combination Supply and Waste Fixture, Nickel-Plated Supply Pipes, Trap and Ornamental Bracket, Nickel-Plated Soap, Tumbler, Brush and Sponge Holders, and 22x32-inch Plate Glass Mirror with Nickel-Plated Brass Frame.

SITZ BATH.—Solid Porcelain Roll Rim Sitz Bath, Class "A," with Porcelain Base to floor, glazed white inside and outside, with "Una-Seal" Decoration, Bell Supply Fitting with Brass Supply Pipes and "Superior" Waste.

L. M. RUMSEY MANUFACTURINC COMPANY

810 North Second Street, St. Louis, Mo.

The JAMES ROBERTSON MANUFACTURING COMPANY

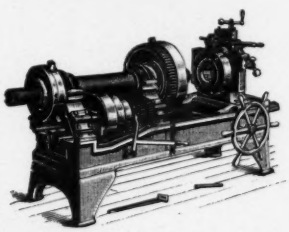
Manufacturers of

Lead Traps — *Enameled Bath Tubs*
Lead Bends — *Lavatories*
Lead Pipe — *Fine Brass Work*
Sheet Lead — *Sanitary Water Closets*
Block Tin Pipe — *Tanks, Seats, Etc.*
Lead and Iron Ferrules.

FACTORY: 827 South Howard St.

Supplies and Tools for Plumbers, Gas and Steam Fitters

OFFICE AND STORE:
30 Hanover St., **BALTIMORE**



Peerless No. 4, Imp. 1 in. to 4 in.

PIPE THREADING AND CUTTING MACHINERY

To Cut from 1-8 inch to 18 inches

HAND OR POWER

Our Machines have Every Improvement for Accurate and Rapid Work.

Bignall & Keeler Mfg. Co., Edwardsville, Ill.

Agents: CHARLES CHURCHILL & CO., Ltd., LONDON. DeFRIES & CO. ACTIENGESELLSCHAFT, DUSSELDORF. AKTIEBOLAGET VERKTYGSMASKINER, STOCKHOLM.

"Repeat it to yourself,
write it down,
do not forget,
but remember,
remember,
remember that advertising is
the news of business,
that good advertising is good
news,
that good news finds listening
ears."

CHARLES MILLAR & SON COMPANY

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CAST IRON PIPE

And Specials for Water and Gas. Wholesale Eastern Agents AKRON VITRIFIED SEWER PIPE.
Flanged Pipe and Fittings, Hydrants, Gates, Pig Lead, Jute, etc.
Manufacturers of Lead Pipe, Solder etc., and Jobbers of Plumbers' and Tinners' Goods.

"The Cast Sink Must Go"

"Columbus" and "New Era"

Wrought Steel Sinks.

ROLLED RIM AND FLAT EDGES.

Painted, Galvanized, Blue Enameled,
Grey Enameled, White Enameled.

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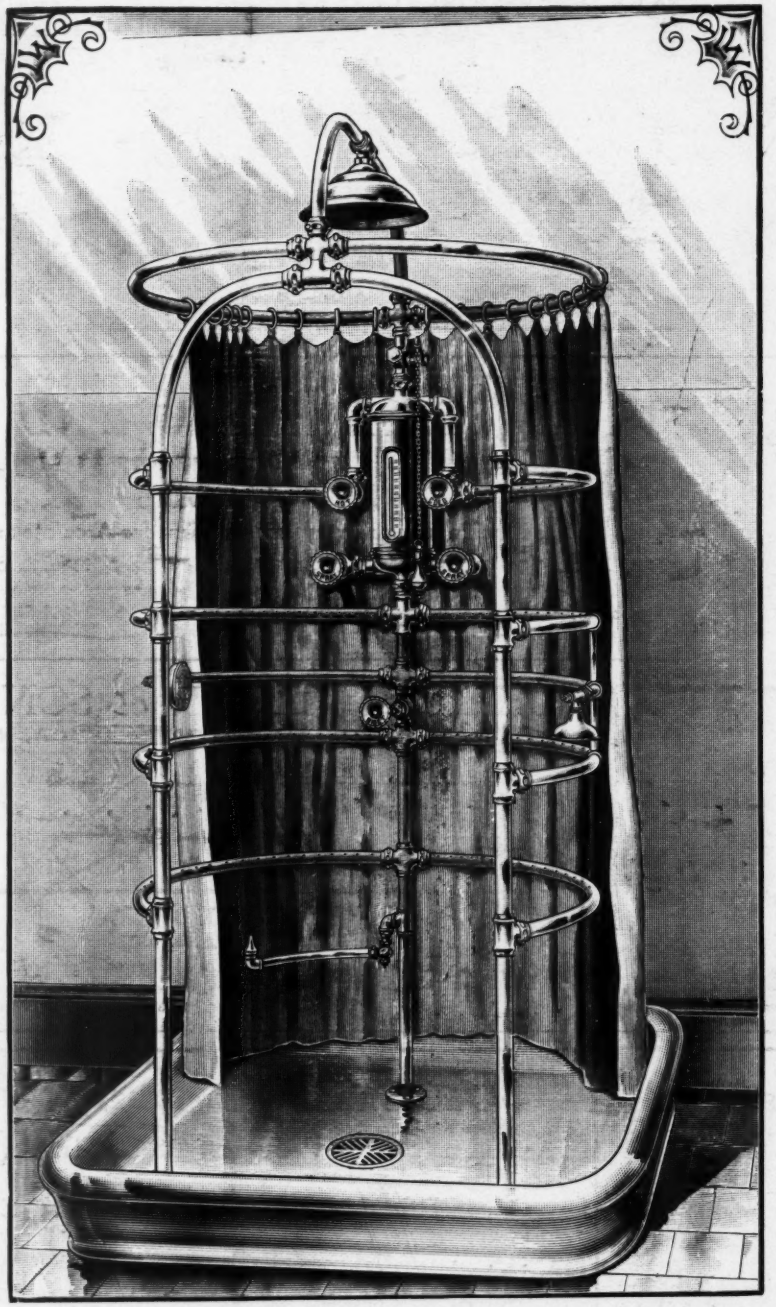
COLUMBUS, OHIO.

L. WOLFF MFG. CO., CHICAGO

F 1847—Oval Combination Needle, Shower and Bidet Bath with Monarch Porcelain Receptor. This Needle Bath has 15½-inch Mixing Chamber, Cast Brass Shower Head, Adjustable Liver Sprays and 6-inch diam. Waste Strainer with 3-inch outlet. The Needle Sprays are so arranged that each side can be operated separately. Bidet is arranged with swing joint so that it can be swung to one side when not in use.



We manufacture a complete line of Needle Baths and Shower Baths for Hospitals, Natatoriums, Residences and Public Baths. Special attention is paid to the Style, Workmanship and material in these baths and in all cases fully tested before leaving our Factory. Illustrated Circulars will be furnished on application. Complete line of Samples on exhibit at our Show Rooms, 91 Dearborn Street.

L. WOLFF MANUFACTURING CO.

Branch: DENVER, COLO. **General Offices, 93 W. Lake Street, CHICAGO**